AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

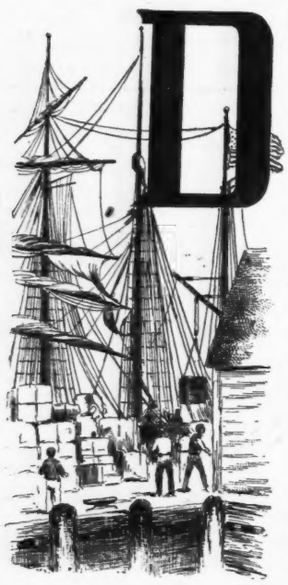
VOLUME LII.—No. 8. NEW YORK, AUGUST, 1893. NEW SERIES—No. 559.

VIEWS OF THE PINEHURST TEA GARDENS, SOUTH CAROLINA.

COPYRIGHT, 1893, BY ORANGE JUDD COMPANY.

TEA CULTURE IN THE UNITED STATES.

DR. CHARLES U. SHEPARD, SOUTH CAROLINA.



DURING the last year, and for the first time in the history of the United States—so far as I am informed — tea was raised and cured on an American farm, and successfully sold in our own markets. It is true that the beginning was small; the young tea gardens comprised but a few acres, and only small and tender leaf was picked; the total production of cured tea not exceeding 150 pounds. Suitability of climate and cheapness of labor are generally regarded as the most important factors in the production of tea. All tea is now thought to owe its origin to that which grows indigenously in Assam, a province wrested by England from Burmah some sixty years ago; but a thousand years' cultivation under other climates have wrought material changes in the appearance and habits of the plant. As the extremes in cultivated tea may be mentioned true Assam, of vigorous growth, with leaves seven or eight inches long and three inches broad, capable of producing twenty-five "flushes" (or crops of young leaf) in a season. In its natural, unpruned state, and growing in the moist, warm shades of its native and fertile jungles, it attains a height of thirty to thirty-five feet. The other extreme is the stunted Chinese plant, rarely exceeding a few feet in height, with leaves of three inches length and one inch width, yielding only three or four "flushes" annually. These deviations from the parent plant are not wholly due to climatic differences, nor are all Chinese plants of equally unprepossessing appearance. Several of the consignments of tea seed which have been kindly secured for the Pinehurst farm by our consuls in China, have afforded vigorous and handsome plants; they came from districts where due attention is bestowed on the cultivation, and especially the manuring of the tea gardens. A great part of the deterioration of the tea plant in China has resulted from neglect, or the economy of that people in assigning it to hillsides and otherwise waste corners or patches of their farms, where nothing else could be made to grow. Here at Pinehurst we have been able, by a generous cultivation, to deck with much finer foliage, specimens that originally presented the extreme Chinese characteristics. But cold unquestionably frustrates attempts to reproduce the Assam variety in less favorably situated lands; indeed, the true Assam can be profitably grown in only a small part of British India.

Intermediate between the tea plants of Assam and China, and the result of the hybridization which followed their juxtaposition, effected during the earlier Indian experiments, stand many varieties of tea; they have been called Assam-hybrids. They exhibit every possible modification between the two parent sorts. For some climates and soils, even in Assam itself, there are hybrids which prove more remunerative than the true indigenous stock. Gardens resulting from the indiscriminate planting of hybrid seed will contain examples of narrow and broad leaf, such as are shown on the next page (Figs. 1 and 2). Large and tender leaf makes more and better tea than does the same product from the narrower variety. Hybridization takes place so freely that the seed of any particular garden and sort can not be relied upon for reproducing itself, if other gardens of different sorts lie within a few miles. It becomes necessary, therefore, if uniformity of stock is desired, to employ seed from a thoroughly isolated garden, or to raise plants from cuttings. Carefully selected Indian and Ceylon seeds may be obtained from estates where they pick from properly cultivated "seed-bearers." These trees are not pruned after the style requisite for leaf produces, but are allowed a luxuriant growth. The cost of a maund (eighty pounds) of well packed seed, delivered in this country, is about $50. But as only one box in four arrives in good order, the real cost is much higher. We are experimenting at Pinehurst on the substitution of cuttings for seed in the propagation of tea, and are hopeful of satisfactory results. But we should feel content with importations of seed from Asia, if we might rely on their being properly selected, packed and forwarded.

Climatic Conditions for Raising Tea.—The question, what is the best climate for tea, does not admit of such difference of opinion as that which asks to what extent are variations from the ideal compatible with a remunerative cultivation of that crop. It may be conceded that the climates of Ceylon and India are best adapted for growing large crops of strong tea at a profit. There are tastes which do not like those teas, especially in this country where the preference is for delicate and rather light infusions. But that the plants of Assam and Ceylon exhibit the utmost vigor of growth and production cannot be doubted. In the consideration of tea climates, it will be well to select for comparison with that of Charleston, S.C. (distant twenty-five miles from Pinehurst, and only seventy feet lower in elevation), the climates of Ceylon and Japan, because these countries are large producers of tea, and yet distant from each other by thirty degrees of latitude. We possess unusually good climatological reports from both of them, viz: "Ceylon administration reports of 1891, Part II, Meteorology," and "Monthly and yearly means, extremes and sums, for 1883, 1884 and 1885. The Imperial meteorological observatory, Tokio, Japan." They were kindly loaned me by the weather bureau, United States Department of Agriculture. The stations selected in Ceylon lie in the principal tea producing region in the central and southwestern districts. The long table shows the remarkable uniformity of the Ceylon climate for any given elevation. The lower regions on the coast are warm. At none of the stations mentioned in the table was recorded a minimum observation below 32° F.; at none a maximum temperature of 100° F.; and among the more elevated stations (more than 2,000 feet) nothing above 92.7° F. In other words, a decidedly equable climate prevails in the Ceylon tea districts. The most remarkable feature of the tables relates to the rainfall. The number of days on which the atmospheric precipitation was measured in 1891 was 200; and the total amount of rain 96.36 inches. The climates of the lower and upper stations differ materially. Those of about 2,000 feet and more elevation above the sea level exhibit some 15° F. less average yearly temperature, and about twenty-five inches less rainfall.

In a lecture before the Dikoya Planters' Association, Mr. Armstrong made the following references to the cultivation of tea at different elevations in Ceylon: "The higher the elevation, the less rainfall is required. The reverse is also true. Light showers, alternating with sun, if we could order them so, would give us

CLIMATE OF THE TEA DISTRICTS OF CEYLON.—TEMPERATURE.

Name of Station.	*Lat. N.* °	*Elevation Feet*	*Average Years.*	*Janu'ry* ° F.	*Feb'u'ry* ° F.	*March* ° F.	*April* ° F.	*May* ° F.	*June* ° F.	*July* ° F.	*August* ° F.	*Septem.* ° F.	*October* ° F.	*Novem.* ° F.	*Decem.* ° F.	*Year* ° F.	*Highest Max.* ° F	*Lowest Min.* ° F
Colombo, Ceylon...	6.56	40	22-23	79.1	80.1	82.	82.7	82.4	81.	80.6	80.6	80.7	80.1	79.8	79.1	80.7	91.1	66.8
Ratnapura.....	6.42	109	22-23	77.6	79.2	80.2	80.2	80.3	79.2	79.3	79.	78.8	78.1	77.6	77.2	78.9	97.2	62.9
Kandy.....	7.18	1,696	21.23	73.2	74.9	77.5	77.8	77.7	75.5	75.	75.	74.9	75.5	79.1	73.6	75.8	98.5	54.4
Nuwara Eliya.....	6.59	6,240	22-23	56.4	57.1	58.7	59.5	60.	57.4	56.5	56.8	57.2	57.5	57.3	56.6	57.6	78.2	32.6
Hakgala.....	6.55	5,581	8	58.	59.4	62.1	63.1	63.8	61.4	61.3	61.7	61.7	61.	60.1	57.5	60.9	73.	41.5
Badulla.....	6.59	2,225	14-19	69.4	70.3	72.9	74.9	75.1	74.9	74.3	79.1	74.1	73.2	72.	71.	73.4	92.7	53.5
Kurunégala.....	7.00	381	5.7	76.7	78.6	81.6	81.7	81.3	79.3	79.7	79.6	79.9	78.6	77.8	77.	79.3	98.8	61.8

RAINFALL OF CEYLON IN INCHES AND NUMBER OF DAYS, WITH REGISTERED PRECIPITATION.

Station.	*January.*		*February.*		*March.*		*April.*		*May.*		*June.*		*July.*		*August.*		*September.*		*October.*		*November.*		*December.*		*Year.*	
	Inch.	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*Days*	*Inch.*	*D'ys*
Colombo.....	2.82	4	1.92	12	5.14	15	10.76	18	13.14	25	7.70	19	5.02	17	4.02	19	5.38	21	14.16	29	12.63	14	6.53	22	89.49	215
Ratnapura	4.78	6	4.52	8	8.53	17	11.68	19	20.19	27	19.99	22	11.78	15	12.92	21	14.20	22	18.23	28	14.36	12	8.92	18	150.10	215
Kandy.....	4.58	6	2.46	7	3.47	10	7.16	9	7.07	23	8.82	20	7.16	25	5.81	17	5.72	20	10.09	28	10.83	12	8.94	24	82.11	201
Nuwara Eliya.	4.75	7	2.28	10	3.04	11	6.04	15	8.84	25	14.33	24	12.24	21	8.57	21	8.66	18	10.74	30	8.79	13	8.22	25	97.21	220
Hakgala.....	6.40	10	2.60	15	4.13	10	7.91	16	9.58	23	7.71	17	5.67	16	4.51	16	6.18	13	10.44	30	9.27	12	14.83	27	88.93	205
Badulla	8.41	9	3.44	11	4.12	8	9.31	9	6.52	20	2.59	4	1.47	3	3.96	2	2.91	3	10.07	29	12.24	12	14.70	26	79.74	136
Kurunégala....	2.42	5	1.48	6	5.79	11	11.60	8	10.06	28	8.76	24	3.78	23	4.05	16	4.14	17	17.31	29	11.44	13	6.13	22	86.96	212

Colombo, Ratnapura and Kurunégala, average yearly climate 79.3 F. Average rainfall 108.85. Other Ceylon stations, av. climate 66.4°; av. rainfall, 86.49 in.

1,000 pounds an acre at 5,000 feet elevation. Although tea does well, remarkably well, up to 5,600 feet in my own experience—and I have had figures shown me proving that tea, at over 6,200 feet, gives, when planted at distances of four by four feet, 400 pounds per acre at six years old—it does not follow that all and any land, at these elevations, will give the same results. The higher we go, the better our soil must be. We must be rather dry than wet; not absolutely without rain for any length of time, but this we need not fear near our mountain tops; and the more shelter from the monsoon winds do we require. Young as we are, and in the face of these yields at seven years of age and upwards, I feel perfectly safe in estimating an average yield of 400 pounds per acre from tea in the coffee zone and above it, say from 2,200 to 5,700 feet in sheltered situations. For low country teas, that is, teas at from 2,500 down to sea level, at six years old, and upwards, I shall be very much surprised, indeed, if they do not show an average yield of 600 pounds per acre. These estimates may seem excessive, looking at the average yields from Assam and India generally, but compare our yield in this, our very infancy, with that of India, and you will find we can even now show an average from estates three and one-half years old up to six, which will more than double theirs. Inclemency of weather does not affect us in the same way as it does our Indian fathers, as we have eleven months in which we pluck."

Thirty degrees to the north lie the tea fields of Japan, which annually send us about 50,000,000 pounds. It has been stated that the tea plant will grow as far north as the limits of the Japanese Empire; it will certainly survive the severe winters that extend

FIG. 1. NARROW-LEAF ASSAM HYBRID TEA PLANT.

down as far as 43° north latitude. But the tea industry finds its home about the great inland sea, and between 32° and 39° north latitude. The reports of the Imperial Meteorological Observatory at Tokio furnish the following data as to the climate of five stations which are situated in the tea producing belt:

CLIMATOLOGICAL DATA FOR CERTAIN STATIONS IN JAPAN, CEYLON, AND AT CHARLESTON, SOUTH CAROLINA.

Stations.	*Latitude N.* ° F.	*Mean Annual Temp.* ° F.	*Absolute Max. Temp.* ° F.	*Absolute Min. Temp.* ° F.	*Mean Temp. December* ° F.	*Mean Temp. January.* ° F.	*Mean Temp. February.* ° F.	*Rainfall per Annum.* Inch.	*No. of Days. Measured. Precipitation.* Days	*Number of Days With Snow.* Days
Tokio, Japan	35.41	55.40	90.50	17.6	40.46	35.96	36.14	55.4	137	9
Nagasaki	32.44	59.54	93.20	24.8	43.70	41.90	41.36	81.6	172	8
Ozaka	34.41	57.29	94.1	22.1	41.36	37.04	37.22	53.3	129	6
Kioto	35.1	49.85	94.1	16.7	39.20	35.33	35.69	58.3	159	23
Kanazawa	36.22	54.14	92.84	20.3	39.92	34.70	34.16	110.	229	56
Mean Japan Sta.	....	55.24	92.95	20.3	40.93	36.98	36.91	71.8	165	20
Charleston, S. C.*	32.47	66.	94.*	20.6*	51.9	49.9	53.7	56.98	118	....
Kandy, Badulla, Hakgala, Nuwara Eliya, Ceylon	6.55 to 7.18	66.4	85.6	45.5	64.7	64.2	65.4	86.49	190½	....

*Data extending back to 1750, with few intermissions. Other Charleston observations of twenty to twenty-two years extent.

It will be seen that the range of temperature is much greater than in Ceylon, the extremes being for average of yearly maximum temperatures 92.95° F.; and for minimum temperatures 20.3° F., with a yearly average of twenty days of snowfall. The climate is moist, as on most islands, yielding 71.8 inches of rain on 165 days. The tea leaf of Japan is better adapted for the manufacture of the green, rather than of the black teas. Many Japanese teas are beautifully prepared for market, exhibiting all the neatness and artistic skill for which the people of those islands are renowned; some of them have a very delicate flavor; very few possess the combination of strength of liquor and rich taste which characterize the better varieties of Indian, Ceylon and Chinese teas. The climate, which proves so favorable for such tender growths as the *Camellia japonica*, *Azalea indica*, and other sub-tropical vegetation, is necessarily a wild one, but the period of annual growth is probably not long enough to induce that vigor which seems indispensable for the production of the finest teas; or, it may be that the Japanese do not understand, as yet, the advantages which follow high fertilization as applied to crops cultivated out of their proper zones.

The relative position of the climate of Charleston is given in the table. Its mean yearly climate almost equals that of the upper stations of Ceylon; it is much warmer than that of Japan. Both Japan and Charleston experience much hotter days than are felt at the higher elevations of Ceylon; they also suffer from much colder weather in winter. The winter months of December, January and February have a mean temperature of 38.27° F. in Japan, of 51.8° F. in Charleston, and 64.8° F. in Upper Ceylon. But the thermometer failed to record at the Ceylon stations a temperature productive of frost; while snow and ice occur very frequently in Japan, and not seldom at Charleston. The greatest summer heat is apt to occur at Charleston. In the matter of rainfall, Ceylon

FIG. 2. BROAD-LEAF ASSAM HYBRID TEA PLANT.

excels, by fifteen inches, more than Japan, and thirty inches more than Charleston; in the number of rainy days, Ceylon leads by twenty-five more than Japan, and seventy more than Charleston. It would, therefore, appear that Charleston, as a tea producing region, labors under the double disadvantage of too great extremes in temperature, and too little rainfall. The future must show whether these difficulties may be counterbalanced in any other direction. On the island of Corsica, M. Marlin has successfully applied artificial irrigation to the tea gardens at the agricultural penitentiary of Chiavari; but the quantity of water per plant requisite each week during the dry season—ten gallons—would amount for an acre of tea garden to at least ten thousand gallons. The pumping-up of so large a volume must be attended with too great cost for its remunerative application. Nor is it probable that the tea plant could stand the large content of sodium salts contained in artesian wells.

The summer of 1892 was a remarkably favorable one for the growth and production of leaf at Pinehurst, forty inches of rain having fallen in the tea-picking season, May to September inclusive. But last winter's cold period, extending from December 27, 1892, to January 25, 1893, was severer than any that the local records contain. Although comparatively few tea plants were killed, it is possible that the vigor of very many more may have been impaired.

Conclusions.—The actual results thus far obtained at Pinehurst, and briefly expressed, are:

1. Tea plants may be successfully grown either from seed, or

from cuttings. It is certain that the Chinese and Japanese sorts, as also very many of the Assam hybrids develop into luxuriant plants here.

2. The yield of tea leaf during the season of 1892 and under the stimulus of high cultivation, proved equal to that of the best Indian gardens of the same age. The rate of production of a well situated and highly manured garden of say 1,500 plants, at six years of age, should amount to from 250 to 500 pounds, according to the size of the leaf that is picked. It is highly improbable that it can ever pay to pick any but the small young leaf which alone is suitable for the manufacture of the higher grades of tea. Asiatic cheap labor—at six to eleven cents daily wages—precludes competition in the inferior sorts.

3. The quality of the tea prepared during the past season has received most favorable notice from competent authorities, and the tea has found a ready market at comparatively high prices where ever offered. Thus far only Assam hybrid leaf has been picked at Pinehurst; and it is better adapted for the manufacture of black or fermented tea. But this season some Chinese and Japanese plants should be in a condition to furnish leaf for experimentation, and it is not improbable that green and oolong teas similar to the Chinese may be made therefrom. Should this leaf prove adapted to this product, the great host of American green tea drinkers may be supplied absolutely pure and American tea to their liking.

As to the question of profit, the problem must remain unsolved for several years yet. Without reference to unforeseen dangers—such as destruction by insects, or other foes—the pivotal factor is that of production, and the Pinehurst gardens are too young to afford satisfactory conclusions. They are also too small to warrant the substitution of machinery for manual labor in the manufacture of tea, a step rendered indispensable by Asiatic competition; but the difference in cost between the two systems may be calculated. We have produced good leaf. It is possible that enough customers may like the style in which the Pinehurst tea of the past season was prepared to consume any possible crop from this farm. Otherwise, it can be prepared to suit them.

At this writing, the outlook for the success of a tea estate of a few hundred acres is good, but it would involve the expenditure of large sums of money. The business should control its own labor, which can be done in the South; it must be cheap, obedient, reliable and intelligent, to a small degree. Perhaps the poorer white classes might be taught to cultivate and properly pick tea, disposing of the product to a central factory; but it is doubtful if they could afford to wait the four or five years after seed planting, which are necessary before any considerable amount of leaf can be gathered. The principal demand for labor in the tea industry is in leaf plucking; it is not arduous, and should be done by women and children. We are hopeful that the possible tea culture may open a congenial employment to them, both white and black.

[In the upper left-hand corner of our frontispiece is presented a view of the entrance to Pinehurst, and in the lower part is given a view of a Pinehurst tea garden of Assam-hybrid plants three years old, the Pinehurst school children picking the leaves. In Fig. 1, on the preceding page, is seen a three-year-old plant of the narrow-leaf Assam-hybrid tea, and in Fig. 2 one of the broad-leaf hybrids.]

THE WOOL MUST BE FED.

S. HENRY.

Dropping the wool is a frequent trouble with sheep. There are many different explanations for this annoyance to the flock master, but few of these hint at all at the fact that wool must be fed, or it cannot grow, and any failure in its nutrition must result in such a weakness that the fleece fails to keep up its connection with the skin, and thus drops off as if it were severed—as it really is—at its root. The fleece of a hundred-pound sheep makes up ten per cent., or more, of the animal's weight, and it consists of a far greater proportion of the most exacting elements of nutrition than the flesh of the sheep does. Flesh has seventy-five per cent. of water in it; wool has only fifteen per cent. The flesh has in its dry matter the following elements, and wool has the quantities set opposite to them. Thus the composition of flesh is: Carbon, 51.83 per cent.; hydrogen, 7.57; nitrogen, 15.01; oxygen, 21.37; ashes, 4.23. Wool: Carbon, 49.65 per cent.; hydrogen, 6.93; nitrogen, 17.31; oxygen, 22.11; ashes, 2.0; sulphur 2.0.

Taking into account that the wool has only one-fifth as much water in it as the flesh, it is easily seen that it requires five times as much of the elements of nutrition for each pound weight as the flesh, and thus, if the fleece of a Merino weighs fifteen pounds, and the carcass, after shearing, weighs seventy-five pounds, equal quantities of food are required for the production of each. This is, perhaps, never thought of by any feeder of the flock, for, so far, it seems to have been completely ignored by all writers upon sheep husbandry; and yet the importance of it is paramount. The common ignorance of these urgent demands of the fleece for special nutriments is, doubtless, the cause why the sheep suffers so much from the exhaustive requirements of the wool. As the fleece must be supplied after the animal itself, the wool suffers while the sheep escapes, at least to some extent; and as the wool cannot exist without its necessary accompaniment of the yolk and grease, which naturally protect it from injury by the rains, heat, or cold, this is to be considered as calling for requisite nutriment as well as the actual body of the animal. It is worthy of note, too, that as wool contains considerable sulphur, this is also to be provided in the food.

Every time the sheep is underfed, or suffers from any other cause, it appears in the wool, the fiber of which shows a thin place in it, and each of these weak spots represents a fault in feeding, or other part of the management. This weakness in the fiber is ruinous to the wool, as it causes it to break in the carding or combing, and thus become too short for the spinner, and fit only for felting. This defect is known by the woolen manufacturers and buyers as "break," and makes it unsalable. Consequently, the matter of feeding, and the regularity of it, are special points to be regarded by the shepherd. Yet it must not be supposed that the wool only suffers; the sheep must necessarily suffer, for the damage to the wool is only one of the visible signs of injury to the whole animal.

In estimating the amount of food necessary for a sheep, all these points are to be taken into account, and the gross weight of the animal is to be increased, for estimating the allowance of food by the proportion to be added, on account of the extra dry substance of the fleece. To be on the safe side, it will be quite reasonable to add to the live weight of the sheep fully one hundred per cent.; that is, to double the weight, and estimate the ration accordingly. The normal allowance of three per cent. of dry matter per one hundred pounds of carcass may thus be doubled, without any fear of overfeeding.

PROVERBIAL DAIRY PHILOSOPHY.

GEORGE E. NEWELL, NEW YORK.

Milk adulteration may be brought about in many indirect ways.

The dairyman who keeps his milk pure can be trusted as an honest man.

As hay is made when the sun shines, so is money increased to that dairyman who managed so that his cows yield milk abundantly when dairy prices are high.

Some people seem to forget that the amount of profit on a pound of butter often depends as much on reducing the cost of production as in obtaining an enhanced price.

The dairyman who dumps a mass of decayed garbage before his cows for economy's sake, is injuring his customers more than if he diluted his milk half with water.

His milk and butter bring just as much in the market as if the food that produced them was grown on Western prairies, and the difference of cost adds materially to his dairy profits.

He commits an equally injurious act against his fellow men when he leaves the carcass of a dead animal unburied in the cow pasture, or daily milks with manure-begrimed hands.

The milk manufacturer who habitually has rich butter-milk, and whey on which a thick blanket of cream will arise, is a costly individual to employ, even when working for his board.

It always pays a dairyman better to stand by a manufacturer who is doing honest work for him, than to take up with a new man who builds a factory for the purpose of "running out" the old proprietor.

The provident dairyman mentally weighs the food requirements of his herd of cows for a year in advance. In most cases he can raise fodder and grain more cheaply than he can buy them, and he plants and sows accordingly.

The dairyman's responsibility for the care of his cows is not all gone when he is able to turn them out to grass in the early summer. The more he feels his responsibility in this direction, and acts upon it, the more valuable will his dairy become to him.

SUFFOLK SHEEP IN THEIR LAND AND OURS.

GEORGE W. FRANKLIN, IOWA.

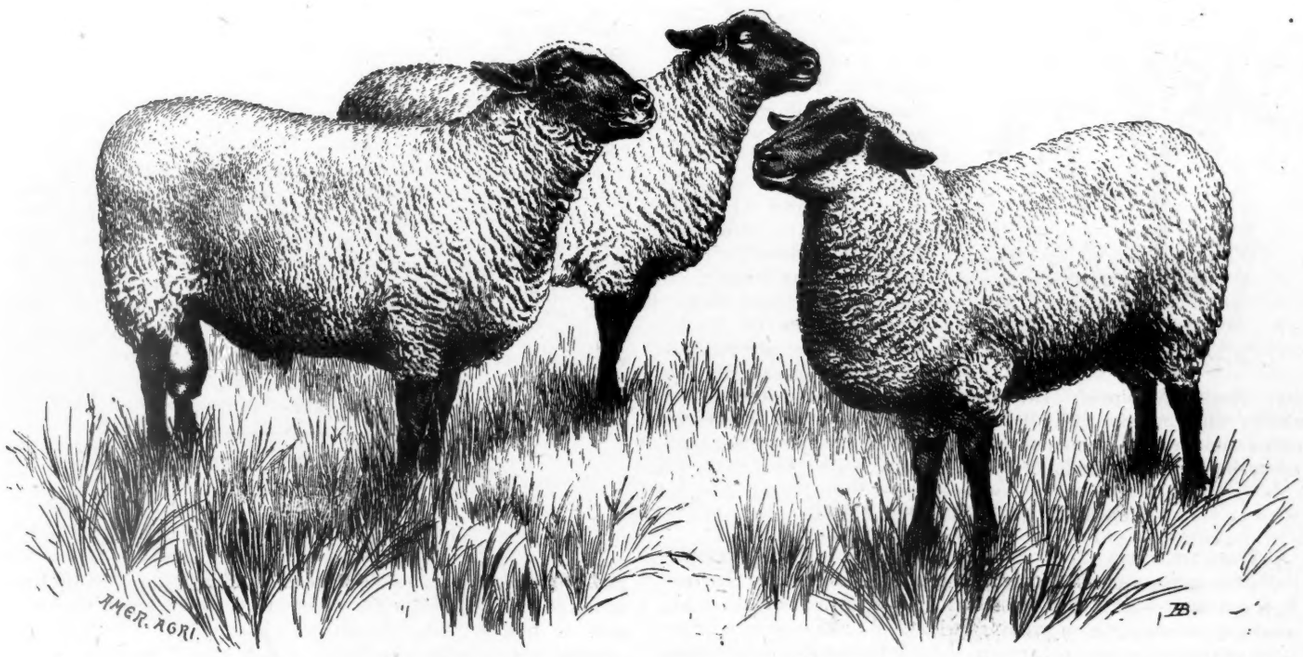
The Suffolk sheep, like many other good mutton sheep of the present day, are the result of a series of cross breeding. The breed originated among the farmers of Suffolk, England, by the use of the old Norfolk ewe and the Southdown ram. The Southdown sheep is so well known that it is not necessary to dwell on its conformation, quality of wool and mutton, constitutional vigor and soundness. The old Norfolk, however, is less known, being now almost extinct. It was large, long bodied, black faced, black legged and hardy. The flesh was known for its fine grain, good flavor, and large quantity in proportion to live weight.

From the year 1800 to 1850 the interbreeding of the Southdown and the Norfolk was quite general. In 1859 these Southdown-Norfolks were first called "Suffolks," classes being given to them by the Suffolk Agricultural Association. The Suffolk sheep, as they now exist, may be briefly described as black faced, hornless, with clean, black legs, about thirty per cent. larger than the Southdowns, which they resemble in character of wool. Among the excellent points of this breed are: Fecundity—Thirty lambs to twenty ewes being a very frequent occurence in large flocks. In the flock of the writer, this spring, are one hundred and sixty per cent. of live lambs to the number of dams. Early Maturity—They are noted for this even to as great extent as the famed Hampshire. One pair of lambs dropped this spring, at this writing—May 9th—weigh an aggregate of one hundred and eighty-two pounds; another lamb, now two months old, weighs eighty-four pounds; the youngest lamb, now thirty-five days old, weighs forty-eight pounds. In England, nineteen out of twenty breeders prefer a tup lamb as a breeder to an older sheep. Hardihood—They will get a living where other sheep will fail to thrive. I have noticed them staying in the pasture during storms which drove other breeds kept on the same farm to shelter. Mutton—The quality is of the finest, with an exceptionally large proportion of lean meat, and commands ready sale, at top prices. Constitution—Their robust, hardy character, power of endurance, and comparative freedom from foot rot have, during the past fifteen years, caused them to displace, to a great extent, the half-breed sheep formerly in favor on the marsh land of England.

In size they are next larger than the Shropshire, with wool a little coarser than that of the Southdown. A gentleman from the State of New York imported a ram lamb nine months old, which weighed one hundred and ninety-five pounds when taken off the vessel, a yearling ewe weighing two hundred pounds (not in show condition), and this same gentleman reports a lamb seven weeks old weighing eighty-five pounds. I had one yearling ewe, in stock condition, at the Annual State Shearing in Iowa, which weighed, after being shorn, one hundred and eighty-eight pounds. The same sheep, in the scoring contest, took the first premium on a score of ninety-six and one-half points. She measured forty-seven and one-half inches around the heart girth, and was thirty-five inches from wethers to root of tail. In this breed will always be noticed the same color of the face and legs—that of inky blackness. Never will a gray, a brown, nor a speckled face be seen.

Some years since the Germans learned the value of this breed, and were the sole importers till quite recently, when they were brought to the notice of American breeders. So far as known, the first importation of this breed was made in 1888. Other importations have followed, and the importers of them have not been disappointed in what they first saw in this breed for America. The one thing that seems strange is that it did not find its way to this country sooner. They are quite plentiful in the eastern part of England, and are beautiful animals, with large, rangy bodies, and very quick to mature.

One of the distinguishing features of the Suffolk sheep is the head, upon which there is rarely any wool. Long, graceful, clean, and coal black, with long, black ears, it imparts a strong individuality to the sheep. I have Suffolk and Cotswold sheep on the same farm, and visitors admire the Suffolks most. They are great milkers, and are very hardy. The venison-like flavor of the mutton recommends it to connoisseurs, and the absence of excessive fat insures a growing preference on the part of consumers.



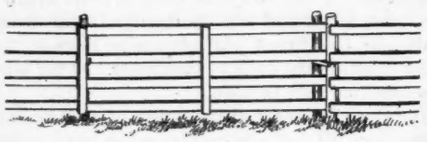
HIGH-BRED SUFFOLK SHEEP.

The American Suffolk Flock Registry Association was established in the early part of the the present year, incorporated under the laws of the State of Iowa, for the purpose of promoting the purity of the breed and providing a reliable guarantee to purchasers, by maintaining and publishing a register of pure-bred Suffolk sheep. The Iowa Suffolk Sheep Company has imported a flock of this breed, which are kept at present on Orchard Hill Farm, Iowa, under the management of its secretary. [Some of the highest-bred animals of this flock are seen in our illustration, engraved from photographs.]

Quietness for Cows.—Never allow your cows to be hurried to and from the pasture, and never allow a dog to worry them. In fact, a dog is a useless thing around cows. He invariably barks, or in other ways annoy them. Cows should always be kept as quiet as possible, that the milk may be normally secreted.

THE CHEAPEST GATE.

When a farmer is able to make a gate almost as cheaply as good bars, there is no excuse for using the latter, as they are certainly very inconvenient. In passing through bars with a wagon, or other farm implement, the time consumed in taking them out and replacing them is a matter of no small moment. Moreover, bars are often left partly put up, and the stock, in rubbing against them, lower the end of one or more of the bars, or the action of the wind causes one end to fall, letting stock into mischief. The engraving, from a sketch by D. S. Barr, shows the construction of the gate so clearly that a description is unnecessary. The gate should be as high, or a little higher, than the fence immediately adjoining. It should be made of light, strong lumber.



AN EFFICIENT FARM GATE.

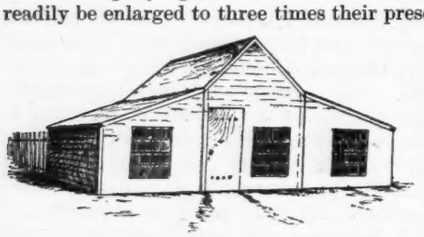
SUPPORT FOR BUSHES AND TREES.

Raspberry and other berry bearing bushes often set and mature more fruit than the stalks can support, and, consequently, are so loaded as to rest upon the ground, injuring the fruit if not breaking the stalk. The same trouble occurs in fruit trees with spreading branches. This can be remedied by nailing together two strips of lath within six inches of one end, with a single round steel nail, and clinching just tightly enough that the laths may be opened or closed for storing away. The manner of using them is shown in the sketch sent us by D. L. Yates. If the surface soil is hard, the lower end of the lath should be pointed. This arrangement, by being kept under shelter when not in use, will last for many years, and frequently saves enough fruit upon one bush to pay the purchase cost, and preparing an entire bundle of laths.

SERVICEABLE TREE SUPPORT.

ENLARGING THE POULTRY HOUSE.

There are scores of poultry houses in the land that are detached buildings in themselves, and in size something like ten by fourteen feet, accommodating twenty or twenty-five fowls; and there are scores of owners of these buildings who would like to keep a larger stock of poultry, were the accommodations for housing them ample. The accompanying sketch shows how these single houses may readily be enlarged to three times their present size, and that, too, at small expense. Two wings of equal dimensions with the original building are built upon its sides, the roof of each being a continuation of the original roof, though forming a small angle at the point of juncture. The side walls of the old building are left intact for increased warmth in the inner room, where a more tender breed of fowls, such as the Leghorns, may be kept in winter, giving the outside rooms to the more hardy Plymouth Rocks, or Brahmas. Through these side walls, however, is cut a door on either side at the front, so that communication may be had with the side rooms from that in the center. This gives but one outside door for the whole building, and so adds to its warmth in winter. The additions, as well as the ends of the main house, should be covered with building paper and then shingled. With a double door and double windows, such a house ought then to be most comfortable during cold weather.

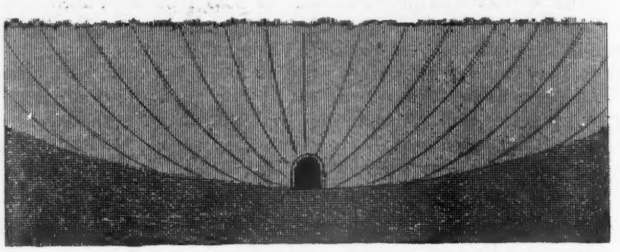


THE ENLARGED POULTRY HOUSE.

WHERE WATER ENTERS THE TILE DRAIN.

L. D. SNOOK.

Most farmers think that the water enters the tile drain only from the soil above. This is certainly a wrong impression, and while it is true that the water in the soil immediately over the drain may enter the tile at or near the top, yet that three feet to each side settles nearly perpendicularly until it strikes the water-soaked soil, and then the natural force of gravity, atmospheric pressure, and absorptive attraction, causes it to enter the drain either at the bottom, or through the joints in the tile near the bottom. The progress of water toward the tile is shown by the lines in the engraving. Immediately over the drain the course is downward; a little farther away the course is a little out of the perpendicular, falling until it strikes the water-soaked soil. Should a section of an underdrain be examined a few hours after a heavy shower, the soil immediately over and in contact with the upper side of the tile will be found quite dry, while the nearer the bottom of the tile is approached, the greater amount of moisture will be found, while at the bottom it will be completely water soaked. Hence, it is useless to place sods or other porous material over the top of tile at the joints, for the purpose of allowing the water to enter. In fact, sod, hay, straw, or other vegetable matter, is the very worst covering to use, as it is only a matter of a few months when it will perish, leaving a greater or less space, that in time particles of earth will fall or wash into, and very much of this loose material finds its way into the drain, often causing stoppage and trouble. For horseshoe tile, a covering of a piece of tough paper, at the joints, is the best thing possible, and may extend down the sides to within half an inch of the bottom. Often, by turning a tile end for end, a better joint is made. Fit them close. There is no danger of getting them too tight.



SECTION OF TILE-DRAINED LAND.

COMBINED FRUIT AND CORN HOUSE.

L. B. PIERCE, OHIO.

Last year I built a combined corn and fruit house, which has some advantages of convenience and beauty. At the sills it is eight feet by twelve, and the sides flare to a width of nine feet six inches at the plates. The sides are eight and one-half feet high, and the roof is half pitch. It is divided across with a partition, and the south half has a bin for corn on each side of the door. The north half has a floor six and one-half feet from the lower floor, and the loft is devoted to the storage of berry boxes and crates. The lower part is used for temporary storing of berries, and other fruit. To many not in the fruit business it may be news to learn that rats and mice are quite troublesome to fruitmen, and for overnight storage it is as important to have rat-proof structures as it is for grain. In winter, mice make nests in packages and gnaw holes in them. In winter the fruit room is used for the storage of soft corn, and barrels of small grain and feed. There is a door in the front gable, as shown in the engraving, so that the entire end can be filled, if necessary; cross boards being placed inside the lower door, with an opening at the bottom for taking out corn. Filled to the peak, the crib end holds 650 bushels. The loft over the fruit room is

PERSPECTIVE VIEW OF FRUIT AND CORN HOUSE.

reached from the corn crib, but there is no difficulty when the crib is full, as the berry boxes are all stored away long before the annual filling. The building is sided on the ends with barn boards dressed smooth, but on the sides of the corn crib the boards are ripped lengthways and placed an inch apart. The building stands upon twelve nine-inch sewer pipes, two feet, two inches high, which rest upon thin flat stones with frost-proof cobblestone foundation. The sockets of the pipe are just below the surface, making the distance from the ground to the under side of the sills twenty-three inches. The pipes set in three ranks of four each, and the sills are two-inch planks ten inches wide, on which the floor of inch oak is laid, and the superstructure reared on this. The capacity of the fruit room is sixty-three bushel crates. In architectural appearance, this building is much more pleasing than an ordinary straight-sided building, or the common, narrow crib. The cost of material was $25. The work included seven days of skilled labor, and two of unskilled. Access is gained to the floor by simple stepladders the width of the doorway, which are hinged to the floor, and are turned up and remain in between the door jambs when the doors are closed. The side pieces of the steps are four inches wide, the same as the studs on either side of the door.

TEASEL CULTURE.

S. A. LITTLE, NEW YORK.

The teasel is a native of Southern Europe and belongs to the *Dipsaceae*, of which natural order there are about 150 known species, natives of temperate latitudes. The only member of this family which has any special value is *Dipsacus fullonum*, or Fuller's teasel. This plant has become naturalized in some parts of England and America, notably in Onondaga Co., N. Y., where its culture is an important industry. The plant is a biennial, and grows to the height of about five feet. The name Dipsacus comes from a Greek word, meaning thirst, given to the plant because the opposite leaves unite around the stem in such a manner that they hold a considerable quantity of water. The stem and leaves are very prickly, and the pale lavender or white flowers are borne in close cylindrical heads. Each floret is provided with an oblong, acuminated, rigid bract, hooked at the point, and it is to this cone-like collection of sharp hooks that the teasel owes its industrial value. The heads begin to bloom at the top, and as soon as the last row of florets on a head has opened and faded, it must be cut, as the bracts soften and lose value. The center or "king"

FIG. 1. BUTTON TEASEL.

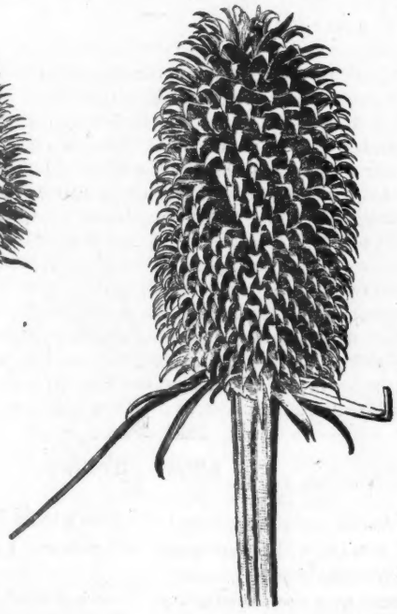


FIG. 2. MEDIUM TEASEL.

teasel blooms first, and this is the most valuable on the plant, each affording but one. These are the only ones ready at the first cutting. The second quality is gathered a few days later, and the small or "button" teasels are gathered at the last cutting. About six inches of stem is left with each head. The heads are used in woolen factories to raise the nap on cloth. It is a rather remarkable fact that no device has ever been invented which quite takes the place of this product of nature. The manner of using the heads is to fix them in the circumference of a wheel or cylinder which is made to revolve against the surface of the cloth. The root of the teasel is fleshy, and possesses some medicinal value, having formerly been used as a diuretic and sudorific.

Teasels are raised from the seed, which is planted very early in spring, in carefully prepared soil, a rather heavy, rich piece of ground being selected. The ground is marked one way in rows three feet apart. About a peck of seed is used on an acre. The seed is small and is covered very lightly. A common plan with Onon-

FIG. 3. KING TEASEL.

FIG. 4. WILD TEASEL.

daga county farmers is to cut a bundle of brush with the leaves on, if possible, and drag it over the rows. The plants are thinned to a distance of six inches at the first hoeing, and beets, turnips, or beans are planted in the rows, the yield from which is expected to pay the first year's expense for culture. Some farmers plant an occasional hill of corn in alternate rows, leaving the stalk in the fall to catch the snow and protect the plant from too much cold. Like most plants, teasels repay clean culture and frequent stirrings of the soil during the first year. The second season they are thoroughly cultivated once, and then left to take care of themselves. The harvest begins in July. The heads are spread about six inches deep on poles, and in a place where there is a free circulation of air above and below. As they dry, the seed drops on the floor beneath and is used to feed poultry, as well as for planting.

The three qualities of heads are not usually kept separate by farmers, but all are sold in bulk. An acre of land will yield an average crop of 100,000 teasels, though 250,000 have been raised under advantageous circumstances. Prices range from forty cents to a dollar and a half per thousand. Teasels pay well when the market is not overstocked, but the demand is somewhat limited, so that this can never become a general agricultural crop.

[Our illustrations, engraved after photographs, somewhat reduced in size, represent in Fig. 1 the smallest, in Fig. 2 the medium, and in Fig. 3 the largest market size. In Fig. 4 is shown the wild teasel, *Dipsacus silvestris*.]

PROFIT IN WHITE FIELD BEANS.

WM. J. THOMAS, MICHIGAN.

What to raise in the place of wheat, which has not been a paying crop for several years, is a question which is agitating many farmers. I believe that, for some districts, beans come nearer to filling the place of wheat than any other crop. Like wheat there is always a ready sale for it, it has fewer enemies, can be kept over with much less shrinkage, as rats and mice do not trouble it, and commands from two to three times the price of wheat, while the vines and pods are fully equal to hay for feeding purposes. A poor soil may raise a fair crop of beans, or a fair crop may be raised with but little work. On the other hand no crop will better respond to good treatment than will beans, and the bet-

ter the soil the better will be the beans. Land that will, in a good season, raise ten bushels of wheat per acre, will raise ten of beans, and land that grows twenty of wheat, will yield as many of beans.

Formerly the crop required a good deal of labor, for it was all done by hand, yet then it was a paying crop; now that we have improved machinery for planting and harvesting, the profits are doubled. One can ride nearly across the State of Michigan and see on almost every farm from ten to forty acres of beans. Here we use a combined harvester and planter, with which one man and team can plant from ten to fifteen acres in a day, and pull them in the same time. They can also be cultivated with a riding cultivator, which makes beans the cheapest cultivated crop grown, so far as labor and expense are concerned. We aim to plant in early summer, taking care to have our ground well prepared. With the planter we can plant the rows thirty, thirty-two or thirty-four inches apart, and from twelve to thirty inches apart in the row, planting in hills of from three to ten beans in a hill. With a riding two-horse cultivator we cultivate from two to four times, and by September 1st pull with the puller, which, when properly handled, will not shell a peck of beans on ten acres, no matter how ripe they may be; this allows plenty of time to follow with wheat if wanted to seed down, or with rye to pasture or plow under. The bean crop here is threshed entirely by machinery, and is destined soon to become the leading crop in Michigan.

RAISING CHICKENS FOR CHRISTMAS.

S. BEEBE.

If one wishes some late chickens to kill, now is a good time to hatch them. Eggs set the tenth of August will hatch the first day of September, and September is a very favorable month for the rapid growth of young chickens. One extensive breeder declares that chickens hatched the first of September will be heavier at two months old than when hatched at any other period in the year. He does not, of course, mean that they will make so large fowls, but that they will make very rapid growth during September and October. Such chickens are ready to kill by December first, and should be, for the most part, marketed before January first. They will be profitable to raise, if killed when young. A few September hatched pullets may be kept over for late summer layers. During the late summer the early hatched pullets will not be ready to lay, and the yearling hens will be moulting, and hence producing but few eggs. But many of these late pullets—such as have survived the winter—will lay right along. Eggs at this season are high, and hence these pullets may turn an honest penny for their owner. Later, when the early pullets and the moulted hens begin to lay, these late hatched ones can and should be marketed.

Owing to the fact that September and October are good growing months, many Bantam breeders hatch their chickens now. They set the eggs from the tenth of August right through the month. The chickens get a good start, and then the cold weather comes on to check their growth, and help to keep them small. August is certainly a good month in which to set Bantam eggs. A few Bantam breeders, particularly those who breed Game Bantams, prefer to hatch their chickens earlier. They believe that the stunting process due to cold weather prevents the Bantams from obtaining as symmetrical development as they would obtain if hatched earlier, and, as the Game Bantams are really the smallest of all the Bantam family, the dwarfing by cold weather seems to be much less needed. But some, even of the Game Bantam breeders, set the Bantam eggs in August. It is probable that more Bantam eggs are set in this month than in any other month in the year, and one could almost say than all the other months of the year put together.

SHADE AND WATER FOR POULTRY.

Give the chickens shelter from the sun. If you have broods in coops, and have trees, as you ought to have, set the coops under the trees with the opening facing to the north. If the chickens run out, give them a run where there is plenty of shade. Low growing bushes make the best of shade for chickens, and in hot days they make the most of their opportunities. The hens may be confined to yards in which there is not a tree or a bush. But they ought to have shade, and if there is no natural, there should be some artificial shade provided. A good substitute for natural shade can be quickly and cheaply made by driving into the ground two forked sticks, resting a pole in the crotch of each, and laying upon the pole branches of trees with the leaves on, the tips of the branches resting on the ground. This makes an excellent shelter from the sun. If nothing better can be provided, boards, instead of branches, can be placed on this pole, but the leafy branches are best. During the hot weather, water should be abundantly provided three times daily, so as to keep it cool. It should also be kept out of the sun. Just why sun-warmed water should make chickens sick may not be perfectly clear, but that it will do so has been demonstrated more than once. The health and the comfort of the chickens demand that the water dish, or fountain, should be shaded.

THE VERMIN PLAGUE IN THE POULTRY YARD.

B. BUTLER.

Hot weather and vermin agree better than either with chickens. Exterminate the lice and use all possible precautions against the debilitating effects of the weather. Many, if not the most, sick chickens are simply lousy chickens. The first step in getting rid of the lice is to give the houses a thorough cleaning. Remove all the old nests and burn them. Thoroughly whitewash the buildings. Add a little carbolic acid to the whitewash as a germicide. Put kerosene on the roosts and their supports. Bring in fresh dust or sand for the floors.

Fumigation is a good thing. To properly fumigate a hen house, shut up all doors and windows, making the house as tight as possible. Drive all of the fowls out of doors. Remove all the eggs, then in a small tub, partially filled with water, put a pan containing a newspaper saturated with kerosene oil, upon which has been placed a couple of pounds of sulphur. A little oil mixed through the sulphur will aid in its combustion. Touch a match to the paper and leave the house, closing the door behind you. Let the house remain closed for six to eight hours. If there are any lurking germs of disease it will be the worse for them. When kerosene and lime and fumigation fail to kill the red mites—the little lice that lurk about the roosts, try the following. Get a quantity of carbolic acid—the refined salts—and dilute with water. Then spray this mixture all over the wood work with a garden pump having a spraying nozzle. Wherever the carbolic acid strikes, the red mite dies. This method has succeeded when others have failed. Kerosene emulsion is said to do the work and is much cheaper than carbolic acid. Blue vitriol—sulphate of copper—is, also, recommended. This, of course, should be dissolved in water and the solution sprinkled about the house. The latest remedy proposed is strong brine. It may do the work, and if it does it will be about as cheap and handy as anything.

Having got rid of the red mites, the fowls next require attention. One way to free them from vermin—the large lice that live upon their bodies—is to thoroughly dust them with insect powder. If this is done a few times, it will accomplish the work. But it is considerable trouble to do this if there is a large number of fowls. An easier method is to let the fowls get rid of the lice themselves. To do this, provide a dusting place by filling a good sized box with sand and dry earth—a box say three by four feet, filled to the depth of a foot. Into this earth and sand mix a liberal quantity of sulphur or some other good insecticide. The fowls will dust themselves in the box and the lice will be destroyed. The chicken coops, as well as the hen houses, should be thoroughly cleaned and be kept so. They need cleaning through the hot weather, frequently. The younger the chickens the greater the need of keeping their coops free from vermin. The large ones can support a few lice and live, but with young chickens it is a choice between them and lice.

SHORT FURROWS.

You can never win your boy's love with a big elm switch.

If you have to bite at every bait you see, you had better have a guardian appointed.

Some men are poor because there is a shady side to a hedge row in the summer time.

The time to pray for good crops is when you are vigorously stirring the soil with good plows.

He who permits his farm machinery to rot in the fence corners makes a first-class "calamity howler."

When you get very angry and feel like saying or doing something real rash, just stand on one foot until you get over it.

The sun shines upon the just and the unjust alike, but the former see a beauty in its rays which the latter can never discern.

THE BLACK-BREASTED RED MALAY.

H. S. BABCOCK.

Before the advent of the Cochin, our ancestors used, for the purpose of crossing upon their common fowls, to insure greater size and better development, the Malay fowl. In those days it was admirably adapted for this purpose, as the cocks frequently weighed ten or eleven pounds each, and the hens eight to ten pounds; and as, despite the ungainly appearance of the fowl, it has a most remarkable development of meat upon the breast, wings and thighs which it imparts to its crossed descendants in a marked degree. Such weights, however, are now rarely attained, the males seldom exceeding nine pounds and the hens seven pounds each. Occasionally there appears a larger bird, and with a greater interest awakened in this neglected breed, it is probable that a near approach to its early size might be obtained. While the Malay is bred in a number of colors, white, pile, black and red, with black breast, the latter is the most popular color, the one that usually wins at English exhibitions and the only one recognized in the American Standard. In the males, this color is similar to that of the Black Red Game fowl, a red neck, back and saddle, black breast, body and tail, but the red is darker than the fashionable shade for the modern Exhibition Game. The hen is of a reddish brown color, sometimes quite light, approaching buff, and occasionally handsomely penciled, somewhat like the pencilings on the Indian Game. The unpenciled birds, however, are preferred in the exhibition room. In shape, the Malay is characterised by a very much carved beak, a head with overhanging eyebrows, a very bare face, a long neck, shoulders of great width, the wing fronts being carried forward prominently, a back that slopes downward to the tail, a narrow tail carried below the horizontal line, and immensely long and very strong thighs and shanks. The plumage is very short, hard and lustrous. Indeed, in a well-bred and well-conditioned Malay cock, the plumage is not outlustred by that of any fowl. The overhanging eyebrows and bare face and throat give the Malay a savage look, and the real nature of the fowl is not libeled by this appearance. Coupled with the above, the long legs and drooping tail make it unique among domesticated poultry. The comb of the Malay is another feature in which the fowl differs from every other breed. It is true that our Standard describes it as a pea comb, and it is just as true that our Standard is in this respect wholly wrong. No Malay fancier or breeder would use a pea-combed Malay if he had or could get one. The comb is shaped something like a walnut cut into halves, a mere lump covered with very small corrugations. The American Standard, before its last revision, described the comb in the following words, "Rather small, in shape resembling a strawberry or knob in front, placed well forward." This description is much nearer what should be demanded in a Malay than the error reported by the committee who had charge of this section of the Standard. Malays are but moderate layers, but the eggs are of good size and very rich in quality. The hens sit faithfully, but are not good mothers, owing to their awkwardness and to an infirmity of disposition, which frequently leads them to scalp the young of other hens which may wander near them, and sometimes even the little ones of their own broods. It is chiefly as a table fowl that the Malay can be commended, and especially as a fowl to cross upon other breeds. The Malay is interesting, not only on account of its own peculiarities, but also on account of its supposed relationship to the Indian Game, a fowl that is very popular in this country at the present time. Many believe the Malay to be one of the parents of the Indian Game; others assert that there is no relationship between the two breeds, but that the origin of the Indian Game is a direct importation; but for my own part, having had a long experience with the Indian Game, I am inclined to the view that there is a relationship between the two breeds, not necessarily that of parent and child, but that both have descended from a common Indian stock, the one developing into the still savage-looking Malay, the other into the more elegantly proportioned Indian Game. It seems to be true that both came from India and that a fowl in all essential characteristics like the Malay is still indigenous to India and the Malaysian peninsula. This type of fowl is common throughout Eastern Asia, and has been for so very many years that one writer truly remarks that it is "one of the most ancient and well-marked of all domesticated breeds." That from this ancient

PAIR OF TYPICAL BLACK-BREASTED RED MALAYS.

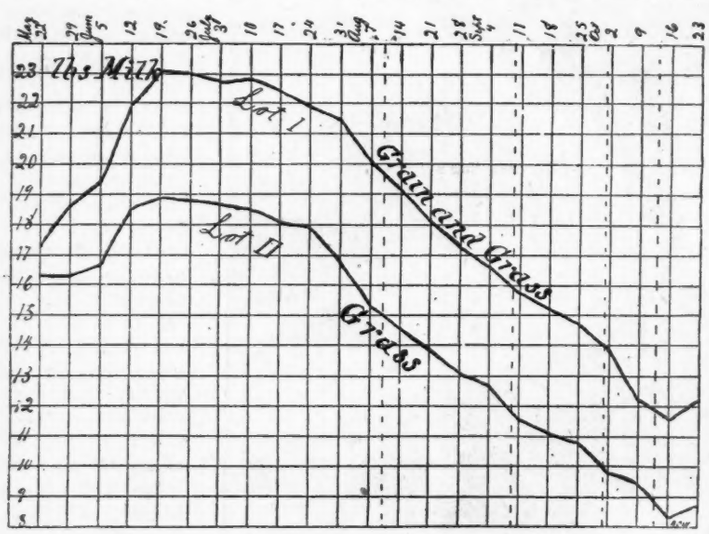
stock, through definitely directed selection, two breeds like the Indian Game and the Malay should have been developed, seems to me the most natural conclusion, and best explains the many resemblances and differences in the characteristics of the two breeds. This is not tantamount to saying Indian Games are Malays, or Malays are Indian Games. The Cochin and the Brahma are doubtless as nearly related as the Malay and Indian Game, and probably in very much the same way, but Cochins are Cochins and Brahmas are Brahmas, despite this relationship.

The Malay has never been a popular fowl, perhaps never will be. Its ungainly shape, its cruel expression and its savage disposition are against it. But one would be blind to the facts if he did not note that the Malay is increasing in popularity. When Lewis. Wright prepared his great work on Poultry, a quarter of a century or so ago, he wrote, "The number of Malay breeders in England could be counted on the fingers," a statement which, in this day, would require considerable modification. And in this country as well as in England the breeders of Malays are increasing, though still by no means numerous. The explanation, in this country, of the increase in popularity of the Malay, seems to be the great interest awakened by the Indian Game, which has called renewed attention to its distantly related contemporary. Possibly the same renown, to some extent, may also be explanatory of the greater popularity in England. The Malay can never become a farmer's fowl. It may, however, be profitably used in crossing to produce fine table poultry by the farmers in this country, though even for this purpose I should personally prefer an Indian Game. If any one contemplates making this cross, let him purchase a Malay cockerel, and breed him with any hens except the Cochin, for this cross according to an eminent English authority is not satisfactory. Upon grade Plymouth Rocks, or Wyandottes, or, indeed, upon almost any ordinary fowl, the cross of the Malay is excellent.

PRESERVING AND IMPROVING PASTURES.

GEORGE E. NEWELL, NEW YORK.

There is no necessity for having short pasturage in summer, unless the heavens fail to supply moisture. In the dairy region of Central New York, we generally enjoy plenty of summer rain, and the two principal causes of deficiency of grazing are, overstocking

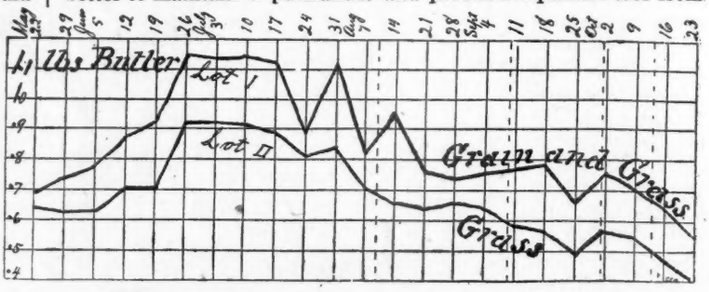


INCREASED MILK FLOW WHEN GRAIN IS ADDED TO PASTURE.

the fields, and neglect. It is common for sheep and horses to run with cows. Sheep, by close feeding, secure the most nutritious part of the grass, and colts, if pastured with cows, annoy and worry them by their playful or vicious antics. Quiet and peaceful possession of the grazing lot is essential to the comfort and profit of milch cows. To remain plentiful the grass should have a chance to grow a little faster than the cows eat it off. Some dairymen will take young stock from outside to pasture when they have not acres enough to properly pasture their own cows. This bad custom is quite prevalent, and frequently accounts for the premature drying off of the mid-summer milk yield on many farms.

On the poorer pastures, where the dry weather of midsummer stops the growth of the nutritious grasses, the cows will give much less milk unless an additional ration of fodder or grain is given, to supplement the failing pasture. The Cornell University experiment station has tried the feeding of grain to milch cows at pasture, and the results are shown in the accompanying diagrams by the curved lines, which show the great increase in both milk and butter. Every night and morning each cow was fed a half gallon of a grain ration, composed of two parts corn meal, one part bran, and one part cotton-seed meal. The cows also gained rapidly in flesh.

A system of general good farming however, will keep the grass in such sufficient supply that it will not thus be necessary to feed grain at this season. At all events, it is far better to maintain a permanent and productive pasture turf from



INCREASED BUTTER YIELD WHEN GRAIN IS FED WITH PASTURE.

which a full yield of milk may be produced, than to depend upon a costly grain diet for the same result. It is quite as important for profit to reduce the cost of milk production, as it is to raise the price of dairy goods. It is an obvious fact that the average pastures in this State are not as productive as they have been in former years. There are areas of hill country, where but little good grass remains in the grazing fields, these nutritious species having been run out and replaced by a sort of fuzzy wire grass that soon becomes sere and brown. The botanists call it Danthonia, but it would be as worthless by any other name. Now, permanent pastures are what we want, provided that they are seeded to nutritious grasses. The great importance of this subject is not appreciated by dairymen. As the pastures run out and become less productive the dairyman turns to forage crops raised on other parts of the farm to make up the deficiency in feed. This is all right as a supplement for pasturage, but it is not good management to let the pastures lie unproductive, while depending wholly upon soiling crops. The pastures are the main stay after all, and on their productiveness dairying must stand or fall. If the pasture lot is treeless, plant shade trees at intervals; if it does not yield varieties of grass suitable for abundant milk production, break it up and reseed it to such as are more profitable. Fertilize a sterile pasture, and protect the sources of the springs that water it. Our fathers reclaimed these fields from the forest; we must reclaim them from the neglected and unprofitable condition into which they have fallen. Sometimes a brook or rivulet flowing through the grazing field may be utilized for purposes of irrigation, when the weather becomes dry. This plan involves little expense, and where the lay of the land makes it practicable, is an efficacious way of preventing a mid-summer decrease in the pasturage and milk yield. Although the whole pasture cannot be benefited in this way, a portion of it may be, which would in a drouth otherwise be dry and verdureless. If willows are encouraged to grow along the banks of these meadow and pasture streams, their shade will not only prevent a rapid evaporation of the moisture but will prevent a gullying away and destruction of the banks in time of freshets. Let us try to do more to build up our long neglected pastures. There is hardly any part of the farm on which a judicious outlay of money and well-directed labor brings better and much more profitable returns than can be secured by the systematic, timely and careful improvement of our pastures.

Cleanly Summer Dairying.—Indoors, particular attention is necessary in midsummer to keep every thing sweet about the creamery. See that the water is changed often in the water tank of the creamery, and the cans well cleansed and scalded. Watch closely that the cloth used about the milk cans does not become rancid. It should be frequently changed for a fresh one, and each wash day all soiled ones should be put through the wash. For milk strainers, nothing is so good as bleached butter cloth. If folded twice, a four-fold strainer will be made, which will be just right over the wire strainer, and be held in place with a tin band.

THREE-QUARTER-SPAN GREENHOUSES.

L. R. TAFT, AGRICULTURAL COLLEGE, MICHIGAN.

Although by no means a new idea, very few three-quarter-span greenhouses, with the long slope of roof to the north, have been constructed. The form most commonly used for rose and other forcing houses, has the long slope to the south, and also differs in having the north wall three or four feet higher than the south, while in houses with the long slope on the north side of the ridge, both walls are of the same height (Fig. 1). It is a well known fact

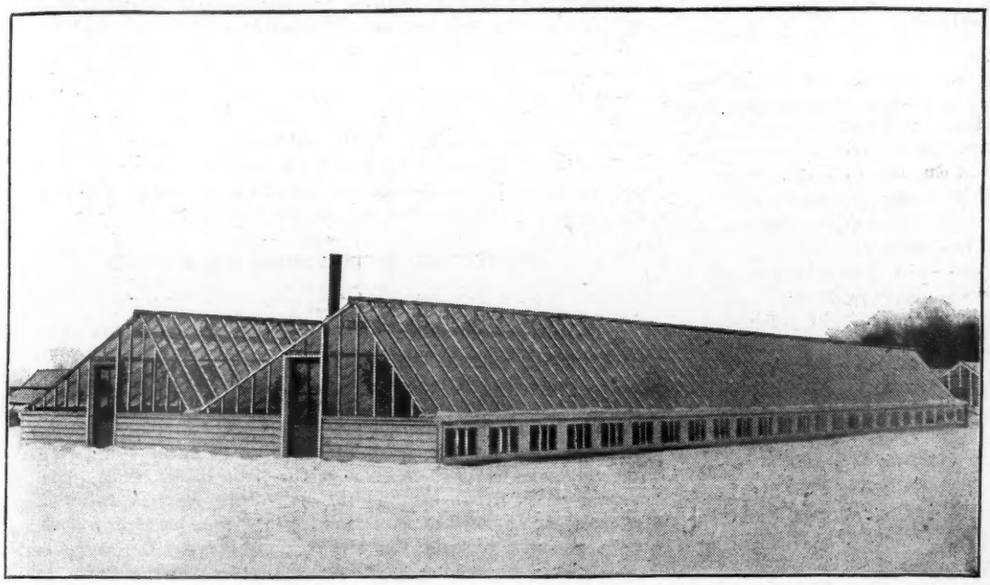


FIG. 1. IMPROVED THREE-QUARTER-SPAN GREENHOUSE.

that, when light attempts to pass through glass at oblique angles, a portion of the rays will be reflected so that—particularly when they are more than 30° from the perpendicular—a large per cent. of the light will be lost. It makes a considerable difference, therefore, what slope is given to the roof. As the common form of a three-quarter span forcing house has a pitch of about 30° or 35° from the

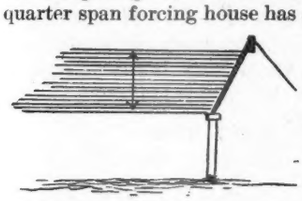


FIG. 2. GREENHOUSE WITH 60° PITCH.

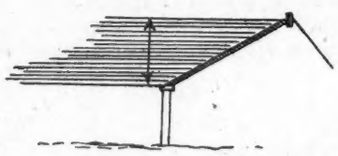


FIG. 3. GREENHOUSE WITH 30° PITCH.

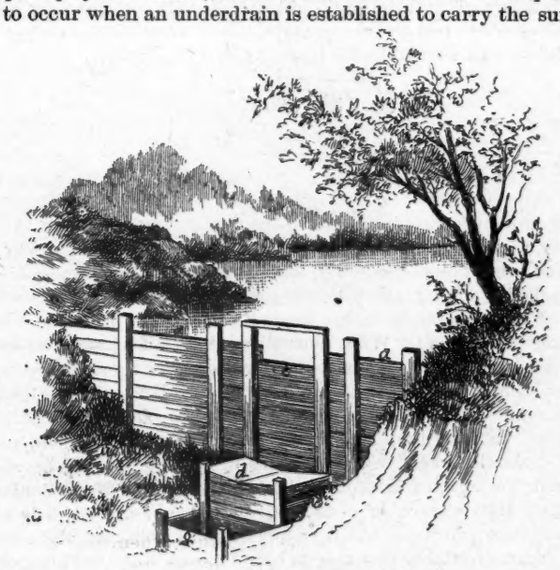
horizontal, it will be seen that the rays of light will strike the glass in the morning at the same angle, and ten per cent. of the sun's energy will be reflected, to say nothing of the ten to twenty per cent. that will be lost in passing through the glass. During the winter months, the average angle at which the light will reach the glass will be about 15°, and the loss from reflection will be about six per cent. Although this loss of light is serious, the common form of roof has the advantage of being down close to the plants.

In the form of roof under consideration, the attempt is made to have the glass on the south slope of the roof as nearly as possible at right angles to the sun's rays. With a pitch of 60° there is but slight loss from reflection—less than three per cent— and as many direct rays, when the sun is at the horizon, come in contact with the glass, and more of them enter a span eight feet long at 60° (Fig. 2) than when a span of sixteen feet has a slope of only 30° (Fig. 3). In most sections of the country, where the snowfall is heavy, the snow lodges upon the flat roofs, and, unless it can be removed, the light is obstructed for days at a time, while on the steep roofs there is little or no trouble from this cause. Especially upon cool greenhouses, the frost that forms upon the glass each night is not melted until the sun attains a considerable height, and, up to that time, the roof admits little light. The steep roof, on the other hand, is generally clear from frost an hour or two earlier in the day, which is of particular advantage in forcing houses during the short, cloudy days of winter. The north slope of the roof in this style of house (Fig. 2) is at an angle of from 30° to 35°, the same as the south slope of ordinary houses, and is, of course, rendered more or less opaque, both by snow and frost. It is claimed, however, by the owners of houses in which the steep slope is to the south that, with the north slope covered with snow, there will be nearly as much light in the house as in an even-span house, with the glass free from obstructions. Granting this to be true, there can be no question of the desirability of this form of construction.

Considering only the south half of the house, where the plants are not far from the glass, through which all direct light enters, there can be no question but that it is an excellent idea. The plants upon the north side, however, are a long distance from the glass, and are more or less shaded by the plants upon the south benches. This difficulty is no more serious than in even-span houses running north and south, and the superior advantages of a house with the short span to the south, so far as the south half is concerned, will certainly place that form of house ahead of the even-span house. As compared with the ordinary form of a three-quarter-span house, the advantages are less certain, although as a form for cool greenhouses it certainly must be desirable. During the past year, houses of this style have been erected by several florists, and, so far as reported, they are quite enthusiastic over them. George W. Miller, of Hinsdale, Ill., has several large rose houses, and Fred Dorner & Son, of La Fayette, Ind., have two large carnation houses built in this way. In both cases, larger and better flowers, greater freedom from disease, and economy of fuel are claimed. These houses are of model construction, and, while still new, naturally give better results than equally well-built houses of the ordinary form of roof, that have been in use two or three years, so that a longer trial is necessary before discarding the old for the new form of three-quarter span forcing houses.

FLUSHING UNDERDRAINS.

After a farmer has spent a great deal of time and money in the construction of underdrains, it is a serious loss to have these stopped up by the washings from the surface soil. This is especially apt to occur when an underdrain is established to carry the surface



MANNER OF FLUSHING DRAINS.

water underneath a level, cultivated field. This danger of stoppage is easily avoided by the construction of a flushing reservoir or dam, similar to the plan shown in the sketch, furnished by L. D. Snook,

in which *a* is the breastwork of dam, *c* the loose boards that are removed at any time when the dam is full, thereby flushing or washing out any sediment that may have accumulated at any portion of the drain. In practice, the greatest point is gained by the washings of the surface soil settling in the reservoir, from whence it is easily thrown out upon the banks, whereas, if allowed to take its natural course, it would have passed into the drain, and clogged up the same. The water passes over the flush boards at *c*, falling on to the platform *d*, and thence into the mouth of the drain at *g*, and thence through the underdrain to the outlet.

WEANING CALVES.

WEBB DONNELL, MAINE.

It is a disappointing time when one sees the calf or colt, that has been growing thriftily while fed by its dam, beginning to look rough in hair and thin in flesh as it comes to the changed conditions of feed when once it has been weaned. It is right here that so much of the trouble comes in attempting to raise calves and colts. It is the suddenly changed condition of feed that disarranges the small animal's digestive organs, and for a while appears to stop its growth entirely. The remedy is plainly the making of the change from the dam's milk to the new food as little of a change as possible at first, and to make this change very gradually.

To do this it is best to begin by allowing the calf, for instance, to take but half its fill of its dam's milk, finishing upon a mixture of fresh milk and warmed skim-milk. Gradually the dam's milk can be reduced in the ration, and the warmed skim-milk increased while into it is stirred a little boiled flax-seed and boiled oat-meal and middlings, very little of these substances being added to the milk at first, while gradually increasing the quantity as the calf gets older and more fully accustomed to this food. The great point is to make the change so gradually, as not to disturb the digestive functions, and no small part of the care required to do this is having the prepared food always of the warmth of new milk. Even after the calf has grown strong and lusty upon its new diet, the milk and mush which is given it should be warmed, as the chilling of the stomach from the drinking of a pail of cold milk, or other fluid, is likely to be the beginning of a serious disturbance that may manifest itself in scours and in a failure to properly assimilate the food taken, which means retarded growth. A calf at this time should have some grass or hay to eat, but let it be clover, if possible, and not too much of that, for weaned calves kept in a stable, frequently over-tax both the capacity and the digestive power of their stomachs by eating large quantities of dry hay, becoming thereby "pot-bellied" and unthrifty. If scours occur, even when every care is taken, a drink of milk freshly drawn from the cow will prove a corrective, while constipation, if it occurs, can be remedied by taking care not to boil the milk when heating it, and by slightly increasing the laxative foods that are added to the milk, adding a little boiled bran, if needed, for this purpose. If such a plan is followed, and the small animal, or animals, are kept warm and given a dry pen, the change from their dams to the pail or the calf-feeder can be made with little difficulty.

FEED FOR YOUNG COLTS.

D. WORCESTER.

A bit of conversation that occurred at one of our State agricultural fairs and was reported in a local paper, seems to illustrate a very common feeling in regard to the feed for young colts. An old farmer approached a leading horseman, and, after explaining the age and other points connected with his colt at home, in all seriousness asked the horseman if he supposed a quart of oats a day would be such high feed as to injure the colt. "A quart of oats!" roared the one questioned; "Why, man alive, that's about what its owner gives his Plymouth Rock rooster in that pen over there, every day!" The old man's ideas were only a little more ridiculous than those of many others. There seems to be a great fear on the part of some farmers that they may feed their growing colts too much, and so these animals take five or six years in coming to an ill-developed maturity on rough fodder, with little or no grain. No animal upon the farm stands more in need of growth-producing foods to make its existence profitable to his owners, than a colt, and the amount that it can profitably consume is by no means small. Think of the feed that the great trotting horse, Axtell, consumed when but a two-year-old, as reported by his former owner, Mr. C. W. Williams: five quarts of oats, two quarts of bran, two quarts of carrots and three or four ears of corn, three times a day! And the speed that he developed under such a course of feeding, showed that he made good use of it. It is not necessary that all should feed so heavily of grain, but enough should be given to keep up a thrifty growth, and an all-round development, both summer and winter. The profit would lie in this, that a much better horse would be produced, and one that would be ready for the harness, or sale, very much earlier in life than its poorly-fed neighbor. There would be serious danger in feeding a large amount of corn to a growing colt, as there would to any kind of growing stock, and a filly should have still less. But when oats, bran, and such roots as carrots, are given, the ordinary feeder will not be likely to give too much. A good many will say that their colts will not sell for enough at maturity to admit of raising them on expensive foods. But no one should raise that class of animals. It is folly to keep any kind of stock that will not repay the cost of keeping in thrifty growth. An inferior animal will hardly pay for the inferior food it is kept upon, much less return any compensation for the work that has been expended in caring for it. Raise the kind of stock for which there is a demand at good prices in the market, and then feed the best growth-producing foods. If this does not pay, do not raise stock.

PROTECTING WORK HORSES FROM FLIES.

S. YATES.

During the summer and autumn months, when flies are most numerous, the work horses, unless thoroughly protected, expend nearly as much strength in fighting the flies as they do in actual farm labor. Of course some horses are more sensitive to flies than others, and many serious accidents to both man and beast have resulted from horses becoming tangled in the harness in their frantic endeavors to rid themselves of the little black pests. The best protection is fly sheets made of some thin, strong fabric. They should reach below the traces on each side when plowing, and should be made in two parts, the first extending from the collar backward, while the second should cover the neck, being secured with strings at the throat and near the collar. To guard against the bot fly, tie a large tassel of cord to the center of the throat strap under the neck, and secure several strings of leather or twine to the martingale, letting them extend down to the knees between the fore legs. The constant swinging movement of the tassel and strings prevents the fly from stinging or depositing eggs. While on the road a coarse net of leather or cord will be sufficient, especially if the horse moves on a trot. If the legs of horses be washed in water in which tansy leaves have been boiled, flies will avoid all such portions for several days thereafter. The large black and green horse flies alight on the abdomen of horses, and this part is protected easily by the use of a tansy wash, which is very readily applied.

CLOVER SEED FROM FIRST CROP.

W. A. GRAHAM, INDIANA.

Something new in agriculture has presented itself in the form of a crop of clover seed from a field sown the same year. It was a complete surprise, and if it proves constant, after repeated testing, may be a valuable feature of the clover crop. The matter was wholly unlooked for.

One of my neighbors, last spring, sowed a small field of rye to clover. It came well and was a fine stand. Immediately after the rye was harvested and removed from the field, he put in a machine and mowed the tall stubble, weeds and young clover, quite close to the ground. He had no other object in view than to get the field in a good condition for a crop of clover hay the ensuing year. After the mowing the young clover made a fine and rapid growth and bloomed profusely. As soon as it became ripe enough to cut for seed he mowed and threshed it through a clover huller, the yield being sixteen and one-fourth bushels of prime seed.

Now the yield of the seed per acre was not so great as to attract much attention, but it was the peculiar circumstances in the case that aroused the attention of the community. I believe it was mowing or cutting down the young clover soon after harvest that caused it to send out blossoms and make a fair yield of seed. Other fields all around just as well set in clover, sowed last spring, produced no bloom worth mentioning. If any of the readers of the AMERICAN AGRICULTURIST have had any experience in this matter, and have found out anything of value, I hope they will report it.

Gathering Fruit.—Both hands should be free to pick the fruit from the tree. The basket may be hung from a branch by an S-shaped hook bent from a heavy wire, or from an old pail handle.

BREAD FRUIT IN THE TROPICS.

HERBERT STANLEY RENTON.

The bread-fruit tree, *Artocarpus incisa*, seen in the Dutch East Indies and in many of the islands of the South Seas, grows forty to fifty feet high, the fruit being round or slightly oval in shape, first green, then brown, and turning yellow when fully ripe. It is from five to eight inches in diameter, and tastes insipid when cooked. I could not determine what the taste was, unless it were grocery store brown paper. In Samoa and Tahiti the tree yields a succession of two or three crops during eight months in the year. "Its fruitfulness is said to exceed even the generous plantain, upon which the natives of the tropics subsist almost solely where the bread fruit is not grown. It dispenses entirely with the labor of the agriculturist, the miller, the baker; there need be no care for seed time or harvest; there is no threshing, no grinding, no kneading; in fact, the islanders of the South Seas have their bread ready prepared, and have only to place it on the coals as they need it," says Ober. This placing on the coals is a picturesque affair, like a Rhode Island clambake. The fruit is cut up, the core removed, and, hot stones having been placed in a hollow in the earth and covered with leaves, the fruit is laid on top, and again covered with leaves and hot stones, on which more bread fruit is laid, then another layer of leaves and stones, and on top of all earth is heaped to a depth of six inches or more. The hot-stone bake lasts about thirty minutes, and the result is a brown piece of natural bread, white, or perhaps yellow, inside, and very nutritious. Some think it more like the plantain than wheat bread. It is almost tasteless when cooked green, but is highly appreciated by experts when allowed to ripen just a little; not to the yellow state, however, when it has a decayed flavor. I found it impossible to like it very much in any state, but it seems to be an acquired taste with some whom I have heard praise it. This is the seed-bearing bread fruit, which grows throughout Polynesia, but the true bread of the Moluccas, which is propagated only by cuttings —the seeds being entirely aborted by cultivation—is a different plant. If a Polynesian plants twenty ordinary bread-fruit trees, he is independent for life, unless his enemy destroy them. The constant feuds of various tribes in the same group, and on the same island, tend to famine, as they wantonly destroy each other's cocoanut palms, banana groves, and bread-fruit trees. The fiber of the inner bark of the bread fruit makes good cloth, but coarser than the "tapa" made from the paper mulberry tree. The wood is soft and light, of a rich yellow, turning to mahogany in use, just right for the dug-out canoe. Then the milky juice obtained by puncturing the bole is used as a gum. Another use is to spread it about as a bird lime, to catch the feathered songsters of the woods. A preparation is also made for tatooing. Usually the Polynesian's house is bamboo leaves and grass; but sometimes bread-fruit uprights and beams are used. In fact, this beautiful and useful tree is one of the choicest gifts of nature to the brown man of the tropic seas. Its deeply-lobed, dark green, glossy leaves, twelve to eighteen inches long, and its useful, if not luscious fruit, afford him shade and food, and if he does not like baked bread, he puts quantities of it in a hole in the ground, often twenty feet in diameter, changing it from sweet to sour, in which state it will keep for months. Some of these silos hold a couple of tons. The indigenous trees of the West Indies and South America, which are of the *Artocarpaceæ* family, allied to the bread fruit, are the bread nut of Jamaica, and the milk or cow tree of Demerara. St. Vincent was the first island of the West Indies where the bread fruit was planted, and there it has flourished to a greater extent than in any other of the Caribbean chain, even invading the forest edges to find a companion in the Trumpet tree, which looks something like it. It grows on plantations, in groves, and in the deeper valleys in a wild state. When at Timor, the easternmost island of the Dutch East Indies, last year, I was reminded of the strange story of the mutineers of the "Bounty." A vessel had been sent to Tahiti in the South Seas by West Indian planters, expressly to get a thousand bread-fruit roots. Lieut. Bligh, who had sailed with Capt. Cook, was in command. Having secured the required number of roots, which were put in garden pots and boxes, filled with earth, and stuck into spaces sawed out to receive them in the special floor built for the purpose in the cabin, the Bounty sailed from the Society Islands April 4, 1789. The famous meeting occurred twenty-three days later, and Lieut. Bligh, with eighteen adherents, reached Timor after a voyage in the ship's launch of thirty-five hundred miles. The Bounty, with its cargo of bread-fruit cuttings, finally reached Pitcairn's Island, and was burnt by the mutineers, who established the famous colony, which has thrived for more than a hundred years. But bread fruit was destined to reach the West Indies, and, in 1793, Bligh succeeded in a second expedition, and St. Vincent received the first installment of the *Artocarpus incisa*.

A BREAD-FRUIT TREE IN HONOLULU, HAWAII.

YIELDS OF WHEAT IN EUROPE AND AMERICA.

J. J. WILLIS, SUPERINTENDENT OF SIR J. B. LAWES' EXPERIMENTS, ROTHAMSTED, ENGLAND.

Every one engaged in farming knows that the growth of wheat depends both upon the weather and the treatment of the land. Even the variety of wheat sown will also have a considerable effect upon the yield of any particular farm or district. In discussing this subject, I cannot do better than quote the experiments of Sir J. B. Lawes at Rothamsted, Eng., because accuracy is thus insured. Among other experiments there have been grown for twelve years in succession (1871–1882 inclusive) twenty-five different varieties of wheat. Each year the best field at command was chosen for the investigation. The two years which give the largest yields per acre during this period were 1874 and 1878. In 1874 each variety of wheat received a manurial dressing of two hundredweight nitrate of soda per acre, and followed a crop of mangel wurzel, which had received barnyard manure. In 1878, the varieties received a dressing of two hundredweight nitrate of soda per acre, and followed a crop of white turnips which had been manured with barnyard dung and artificial fertilizers.

In 1874, the range was from sixty-seven to forty-one and one-eighth bushels per acre, with a weight per bushel ranging from sixty-five and one-fourth pounds to fifty-eight and one-fourth pounds. In 1878, the range was from sixty-six and one-eighth to forty-two and one-fourth bushels per acre, with a weight ranging from sixty-four pounds to fifty-eight and seven-eighths pounds per bushel. The general average, both of quantity and quality, being very similar in the two years. In 1891, one of the Rothamsted fields planted with Square Head wheat and manured with two hundredweight nitrate of soda per acre, following a crop of mangel wurzel, which had received a dressing of barnyard dung and nitrate of soda, yielded fifty-nine and three-eighths bushels of marketable wheat per acre of sixty pounds per bushel.

Taking an illustration from Sir J. B. Lawes' noted experiment wheat field, which this year (1893) is growing its fiftieth crop of wheat in succession on the same land, we find that 1863 was the year which gave the greatest yield. In the following table are seven selected plots with different manurial treatments, showing the yield of marketable grain per acre, and the weight per standard bushel of the grain. The variety of wheat is the Club or Square Head Red. It may also be mentioned that the same description of manure has been applied to the same plot of land since the commencement of the experiment in 1844. The quantity and quality of wheat grown in the experimental field at Rothamsted, England, in the year 1863, was:

Manures per acre.	*Yield per acre.*	*Weight per bushel.*
	Bushels.	Pounds.
Without Manure	17¼	62.7
Barnyard Manure, 14 tons	44	63.1
Mixed Mineral Manure alone	19½	63.0
Mix. Min. Man. and 200 lbs. Ammonium Salts	39½	62.3
" " " " 400 " " " "	53½	62.5
" " " " 600 " " " "	55¼	62.3
" " " " 550 " Nitrate of Soda	55½	62.1

The mixed mineral manure consisted of the sulphates of potash, soda, magnesia and the superphosphate of lime. The data thus given show that the yield of wheat on the unmanured land was seventeen and one-fourth bushels per acre, and as previous to the year 1863 nineteen crops without manure had already been taken, the produce obtained was not the largest which had been grown, and it is quite probable that had the season of 1863 occurred at the beginning of the period, the yield would have been considerably over twenty bushels. As it was, the yield of 1863 was equal to the average of the first eight years of the experiment.

The produce of the land receiving fourteen tons of barnyard dung every year was forty-four bushels, and contrary to what might be expected, the produce of wheat grain with this dressing while it falls greatly in a bad season, does not rise so rapidly in a very favorable year. The artificially manured plots which receive an equivalent amount of nitrogen to that supplied in the dung, but in the form of ammonium-salts or nitrate of soda yields over fifty-five bushels of wheat, equal to eleven bushels per acre in excess of the dunged plot.

It has been stated that, excluding recent bad seasons, the average yield of wheat per acre of the old arable soils of Great Britain is twenty-eight bushels. Comparing this yield with that of the United States, we find, on the authority of the U. S. Census Bureau, that the general average of localities and years is eleven and nine-tenths bushels per acre; a yield which is not equal to that of the continuously unmanured plot at Rothamsted, and which is considerably less than half the average yield of Great Britain under ordinary cultivation. This may be partly due to a shorter period of growth, and to rapid maturing, or in some localities to deficiency of rain; but it is probably largely, also, due to want of sufficient labor to clean the land, and to consequent luxuriance of weeds.

The general averages of the different sections of the United States ranging from fifteen and one-tenth bushels of wheat per acre in New England, to seven and three-tenths bushels in the South Atlantic and Eastern Gulf States. Even the Northwest and Minnesota, including much prairie land, give very meagre average produce for such rich soil. So long as wheat is grown on such lands under the conditions frequently, and, indeed, almost always, inevitable in the case of new settlement,—that is, growing it year after year, with deficient cultivation, luxuriance of weeds, and the burning of the straw,—only low yields per acre can be expected. The result of these low yields is doubtless due to the fact that fertility is cheap, and labor dear. But with increased density of population, more mixed agriculture will be adopted. Stock will be kept, the farm kept freer from weeds, the straw used instead of being burnt, and the manure from it, and from the consumed food, returned to the land. Then, and not till then, will the fertility of the rich prairie soils be conserved, and not wasted, as is too often the case under the necessities of the first breaking up, and the sparse settlement of the country. That these rich prairie soils can, and should, yield more produce than they do, is clear from the high yields obtained occasionally, under favorable conditions of cultivation.

The following are estimates of the yield of wheat, in bushels per acre, on the prairie soils of Manitoba, Canada, for the seven years from 1876 to 1882: In 1876, thirty-two bushels; 1877, twenty-seven; 1878, twenty-six; 1879, twenty-seven; 1880, twenty-nine; 1881, thirty; 1882, thirty-two; a general average of twenty-nine bushels per acre. These estimates are founded on the reports of numerous farmers, and it is seen that the average yield of wheat for the seven years, 1876 to 1882, is assumed to be twenty-nine bushels. This is, however, doubtless too high, even for exclusively virgin prairie soils, under the condition of cultivation incident to new settlement; and the result is probably accounted for by the fact that the records come chiefly from the more intelligent and better farmers.

That most wonderfully prolific crops of wheat can be grown, even now, is shown by the fact that, in the year 1883, Elliott T. Brady of Buffalo Forge, Rockbridge Country, Virginia, grew a crop of white Mediterranean wheat on a heavy red clay soil. The land was first well plowed and harrowed twice with the Acme harrow, which thoroughly pulverized it. The seed was sown with a drill at the rate of one and one-fourth bushels per acre and finally top-dressed with well rotted stable manure at the rate of fifteen loads per acre. There was no other cultivation. The land had previously been in wheat. At harvest the yield was found to be at the rate of ninety-two bushels per acre, weighing 64 pounds to the bushel. This most extraordinary yield is quoted in the United States Farmers' Bulletin, No. 4, and is said to be strictly true in every way.

SHADE FOR STOCK.

Stock of all kinds are not unlike mankind in some respects, and seek the shade whenever possible during the extreme heat of summer. To gratify this desire, shade should be provided wherever practicable, and the cheapest manner of doing this is through the medium of shade trees. One or two should be set out in each pasture, and be protected by a fence until thoroughly established. If the field be tilled, set the trees along the south line, selecting those of rapid growth and spreading branches. If they be fruit trees, they should be trimmed to a height of at least seven feet, and then allowed to branch out. While the trees are growing, it would be simply humane to provide a temporary shelter of some kind, such as setting a few posts, and covering with poles, upon which are thrown branches of evergreens, or even limbs of oak or other trees in full leaf. This will afford a useful shelter, and if located upon a knoll or other naturally poor portion of the field, it will thoroughly enrich the soil. By changing its position yearly, various portions of the field will be benefited. All this takes but a little time, and can be done when other work is not pressing. By boarding up, late in the summer, the side from which the prevailing winds blow, a fair protection from the chilling blasts will be obtained, and the stock will return you the cost.

THE FARMERS OF THE CHINESE EMPIRE.

FRANK J. WISSNER.

The farmer of America has his ideas about farming, and so has the farmer of the Orient. The difference in culture is great, and so is the difference in yield, the balance being greatly in favor of the Chinese farmer. China is indeed a strange country, with a population of many times that of our country, and a good deal larger territory. The reason for this is very simple. The inhabitants are decidedly opposed to any change, and are content to let things remain as they are. The improvements introduced by foreigners meet with hostile demonstrations. The natives destroyed the poles of a telegraph company, on the ground that the poles cast a shadow on the graves of their departed ancestors. All classes are superstitious — the mandarin as well as the beggar, the farmer as well as the laborer—and the superstitions, having the root of centuries, are not likely to be banished in a few years. China is thickly populated, and some of the natives live on floating farms. In Chinese Tartary there is an abundance of land, which is unoccupied. In the thickly settled parts of the country—and that is almost the entire eastern part—it is an immense farm which contains four acres. The majority of the farms do not contain more than from one-half to one and one-half acres, and the returns from these suffice to keep the owner and his family alive from one year to another. These small farms are thoroughly tilled, but the manner in which they are cultivated would seem like child's play to our farmers. The plow is not used on them, and the spade is an unknown thing. Instead, a sharpened bamboo stick and an imitation hoe are used in the cultivation of the field. The seed is carefully hoarded and sparingly sown, and a uniform line is not kept, as by our farmers. With a view to economizing space, seeds are sown in every conceivable place, and nothing but heavy fertilizing would enable them to secure the results they do.

FIG. 1. PLOWING IN CHINA.

FIG. 2. CHINAMAN CARRYING BUNDLES OF GRAIN.

Just before the seed is sown, the sharpened bamboo stick is thrust into the ground, and the soil made mellow. The seed is then carefully placed in the ground, and covered lightly with earth. This may seem a tedious way of planting, where everything is sown by machine, or broadcast by hand, but in China labor is cheap, and time comparatively nothing. When the plant begins to appear above the ground, the hoe is brought into use, and is kept at work until the crop is harvested. On the larger farms, and all those over two acres are considered large, the land is turned with a plow. And what a plow it is! The same model was used centuries before, and perhaps a farmer is using an implement which was purchased and used by three or four generations ahead of him (Fig. 1). Even with the plow, the soil is not stirred to any great depth, and three inches is considered something extraordinary. When a man owns a farm of this size, he is considered to be a wealthy landowner, and is justified in employing two or three hands.

The horse is an almost unknown animal in the interior of China, and his place is taken by the domesticated buffalo or water ox (Fig. 1). This is rather a diminutive animal, as compared with the species found in our country, yet, nevertheless, he is a good worker, and is prized as such by the natives. In many large cities the buffalo furnishes the power of the mills. The animal is held in high esteem by the Chinese government, and it is unlawful to kill the buffalo and use its flesh as food. On account of its aid in plowing, the animal is considered as deserving of great praise. The high Chinese officials are the only men able to own horses, and the cost of keeping one is considerable. None of the clover, timothy, or other grasses cultivated in America are grown in the Empire. There are no meadows in China, since the land is too precious to be devoted to them, and what wild grass there is has a very scant existence. When cattle are turned out to pick up what pasturage they can, they are closely guarded by little Chinese children. There are two reasons for this, the principal one being that the animals are liable to injure the crops, or wander away to a neighboring farm and ruin the crops on that. There are no fences, and it seemed strange to me to pass through miles of country without seeing any such dividing line. Land is in demand, and wood for fuel is scarce. A little raised pathway separates adjoining farms, and crops are grown to the very edge of the pathway. Hedges are unknown,

FIG. 3. CHINESE THRESHING MACHINE.

and do not seem to be necessary, since this method of separation gives general satisfaction. The cattle secure all their food by grazing during the summer, and they are carried through the winter, principally, on rice and wheat straw.

The wheelbarrow, or cart, is an unknown thing on a farm. All transportation on the farm is done by hand. When it is necessary to transport bundles of rice, or wheat, or other things, from one end of a farm to another, they are carried in a manner peculiar to China. A pole is thrown across the shoulders, and a sheaf is fastened at either end (Fig. 2). This is a slow and tedious way of transportation, yet this method is universal in all parts of the Chinese Empire. The farm laborers, without an exception, are a very poor set, but they manage to live and be happy on a cent or so per day in our money. Where a farm is worked by an owner, without paying for help, his wife and family assist him in the cultivation of the

field. Even children, when only five or six years old, have certain work assigned to them. The children of these lower classes do not enjoy the advantages of securing an education at a school. There are no free schools in the rural communities, and in what schools there are, the cost of tuition is beyond the means of a farmer.

On large farms it is not a strange sight to see women working among the hired help. This class of women are those whose feet are not bandaged, and who are known as the large or natural footed women. They being the children of poor people, their feet were not bandaged in early childhood, as are the feet of those whose parents are comparatively well off. These women work as hard as the men, carry burdens in the same manner, and enjoy the noon-time siesta with them. In plowing, only one animal is harnessed to the implement, and the guiding is done by means of a rope tied to a ring, which is fastened in the nose. The harness is the simplest I ever saw. A semi-circular yoke is placed over the back of the animal's neck, the traces are twisted once or twice around these ends, and curve in front of the collar bone, after the manner of our breast strap. This forms the whole set of harness, and for cheapness and lightness, it is unequaled. It is the work of but a few seconds to place this harness on, and the quickness and dexterity of some farmers would rival our manner of harnessing the horses of a fire engine. The breast strap, if it can be called such, is sometimes wrapped with pieces of cotton or straw, to keep it from cutting the animal's hide.

All the crops are reaped by a sickle or bill-hook. Although our reapers are a great improvement, they would be of little use to an individual Chinese farmer. His farm is small, and an American reaper could cover several farms in the course of a day. Threshing machines are also unused in the country. All threshing is done in a primitive manner. Rice and wheat are usually threshed by beating them upon a frame of slats (Fig. 3). Another mode is by flails on the hard ground. When the grain is to be threshed on the frame of slats, the operator takes a small quantity of the grain in both hands and brings it forcibly upon the slats until the grain is all beaten out. The straw is then placed on a pile, and another handful is taken up and the same process undergone. It may easily be imagined what time it takes to thresh an acre of grain, since this is about the slowest way of threshing, unless some one had the patience to pick out each individual grain by hand. After the grain has been threshed, the winnowing is next in order, and the manner of performing this is in like order as the threshing. On a good many farms the grain is thrown in the air, and the wind is allowed to perform the winnowing. By another method a machine is used. It is a rudely constructed fanning mill, and very much resembles our Western fanning mill, minus sieves. Indeed, the claim is made that the fanning mills made in America are only improved Chinese fanning mills.

The whole property of a well-to-do Chinese farmer consists of a house, the material of which consists mostly of mud and reeds, or bamboo, or sometimes of stone or brick, with a roof of straw or reeds, a bullock or buffalo, or cow, a few fowls or ducks, and a few primitive agricultural implements. With this amount of property, he is looked upon as being above the average farmer, and is a person of prominence in his locality. The farmer and his family live entirely on the productions of their own farms, and two hundred copper cash, or twenty cents a day, is about the market value of the food consumed by a family of four people—a man, wife, and two children. Seeing how cheaply they live, it is wondered, probably, what constitutes their food. The ordinary daily food is rice, and in some sections bread, made from wheat flour and millet, some salted vegetables, and a slight decoction of the most villainous tea. This menu is varied on festive days with some pork, fowl, or salted eggs.

FEEDING THE CORN CROP.

HENRY STEWART.

There is no doubt of the fact, proved as it has been by many exhaustive experiments, that the use of fertilizers is far better for the corn crop than that of ordinary manure. The productive ability of the corn plant is amazing. A single seed will reproduce itself 500 to 1,000 times, while the plant itself takes a large amount of nutriment from the soil, making as it does not less than twelve to twenty tons of green stalks and leaves on one acre. This great product necessarily calls for a large amount of available nutriment in the soil, all through the period of the growth of the crop. It is the result of a large supply of ordinary manure that the first growth is greatly stimulated, and the stalk and leaf become exceedingly luxuriant, but this luxuriance is not continued to the end of the season, failing at the very time that the seed is forming, and the most valuable product is to be made. Hence the ears are often not filled out and the yield of grain is greatly reduced. The large crops grown in competition for premiums have all been produced by a system of full feeding, by which every ear is filled to the tip with full sized grains. It is the vacant spaces on the ears that so reduce the yield, which might be fully one-fourth more if well filled out.

A little figuring will show how much the yield is increased by having all the ears filled and the grain of full size. I have grown corn crops, an average ear of which has made a full pint of grain, and the largest has yielded a quart. With two ears to each hill, and the hills three feet apart each way, the ears having only one pint of corn on an average, the yield will be over 150 bushels to the acre. One of my crops made something over 125 bushels of grain per acre, others have made a full hundred, and several over 90 bushels, and the average for years has been over 80 bushels; but I never made such large crops by the use of yard manure alone, and only by means of commercial fertilizers, while the largest yields have always been made by successive applications of the fertilizer. Under this system the whole quantity of fertilizers applied have been considerably less than that used in other large crops which have been grown by one application only, made at the planting.

This, doubtless, is due to the loss of plant food by percolation through the soil, during the season of growth. But if the food had been supplied to the crop at intervals when it could be taken up usefully by the plants, the crop would have had the whole benefit of it, and no loss would have occurred. Thus if the fertilizers used had been given at such intervals as the food is most needed, and could be made immediately available, the crop would be the largest possible. This has been found fully proved during nearly twenty years' experience, and the same result to some extent has been gained by frequent cultivation of the crop, which has the effect of making plant food in the soil more available, but not to the full extent as when the cultivation has been given with the fertilizer.

The periods of growth at which this successive feeding is needed, are when the plant is about to show the tassel, again when the silks appear, and again when the grain is filling. These are the times when the plant is appropriating the most food, to enable it to meet the heaviest call on the soil for nutriment. The reproductive period is always such a time, as this calls for the exercise of the greatest vitality in the plant, which, in this case, certainly may be believed to be in an analogous condition to an animal at the breeding season, when its vitality needs to be most supported. And if there is such an analogy between plants and animals, then this is to be considered in the feeding of the crops, especially one of such vigorous growth as corn.

Believing this, then, my practice has been to provide this needed stimulus in the shape of 100 pounds of fertilizer at each of the periods mentioned, and it has certainly been effective. When I have used as much as 600 pounds per acre in the whole, 300 pounds of it has been applied immediately after the planting, and the remainder has been used at intervals during the growing season, and always immediately after a cultivation, when the fertilizer has been dissolved and diffused in the soil at once. A similar result has been reached by the mere cultivation of the soil at intervals of a week, making a rule to begin this work every Monday, or as soon after as the weather would permit. This cutivation has added twenty bushels per acre to the crop, as compared with part of the field on which the working was done only three times and when it was necessary to keep down the weeds. This shows how important it is to ignore cultivation as a mere mode of destroying weeds, and to consider it solely in regard to the needs of the crop for the plant food which it liberates, and the moisture it preserves in the soil. And this frequent cultivation is most needed in the dryest weather, for the mellow, porous soil takes up moisture greedily during the night, and holds it more firmly against evaporation during the day.

Cool Churning in the Morning.—On hot days, it is a good plan to have the churning ready the first thing in the morning. Set one of the men or boys at it before breakfast, and see how much better it is to get it out of the way before the sun gets very high. Always throw a handful, or more, of salt into the churn when the cream begins to granulate. It assists in the separation of the butter, and the buttermilk will draw off much more freely. Keep the temperature at 60°, using ice in small lumps to accomplish the desired result. Neglect to do this, will surely spoil the butter.

SOME AGRICULTURAL FEATURES OF THE COLUMBIAN EXPOSITION.

JAMES K. REEVE.

There are very many things in the World's Fair, at Chicago, that are well worth careful study; but I think I may say, without prejudice, no department is more worthy of study than that of agriculture. The Agricultural building has been illustrated in a former number of the AMERICAN AGRICULTURIST, so I will not give much space now to its exterior. Yet upon one corner of it is a legend that is worth repeating, because it is suggestive: "Loiterers that never sow, nor put a plant in earth, nor use a plow." When once inside, one quickly finds that such loiterers had nothing to do with the display of the world's progress that is here made. And such an opportunity to see what this progress really is!

Entering beneath this inscription, one comes first to the display made by Liberia. This, as your readers know, is the negro State in Africa, which was acquired and partially settled, many years ago, by the American Colonization Society, an organization formed for the purpose of returning liberated American negroes to Africa. In this display, we see agriculture in its crudest forms. There are many furs and skins, which show that the animals of the chase are more common than the domesticated creatures of the farm. There are coarsely-woven cloths, which, in texture and barbaric design, remind the visitor of the work of the American Indians. The principal products of the soil are peanuts, coffee, and small corn, to which may be added palm oil, although the latter is not strictly a cultivated product, but is prepared from the lavish natural growth of the palm trees. Liberia is known to possess one of the richest soils in the world, so that the crudeness and poverty of this exhibit still more emphasizes what progressive agriculture, and the lack of it, mean to a land. From Liberia we come directly upon two other tropical displays, those of Curacoa, an island of the West Indies, and of British Guiana. The former of these seems to be only slightly more advanced than Liberia, as the exhibit consists largely of feather and straw work, shell work, native crude pottery, and other handicraft of a not highly developed people. With it, however, are some wines, jellies, grains, and handsome woods, which show them conscious of wider resources. But a thatched hut and a statue of a native laborer show much room for progress. The display from British Guiana is more ambitious. It is especially noticeable for its display of woods, combining fineness of grain with beauty of color, and which are well adapted for every purpose of the cabinet-maker's art. Huge natural pillars of these surround the booth, while polished slabs and sections are shown everywhere. Some of the names of these woods are curious enough to be repeated. There are black green-heart and purple-heart; monkey-pot, hackia and crab-wood; pakoorie, hoobooballi, yellow cironaballi and wamara, and others quite as strange. As might be expected, this exhibit contains some sugar. There is raw cane sugar, sugar crystals in all grades, and as made for various markets. And next to it is that other less beneficent product of the cane field, Demerara rum. Cocoa beans and fibres of various sorts show other sources of agricultural wealth. Among the latter are sisal and silk grass, bamboo, plantain, cocoanut, palm and curious bark fibers, with unpronounceable names. In contrast to these manufactured products are the many cases of brilliant-plumaged birds, the more than thirty kinds of monkeys, and the carved and rudely-painted calabashes that serve to show how nearly the country is yet in a state of nature.

STATUARY IN THE AGRICULTURAL BUILDING AT THE COLUMBIAN EXPOSITION.

Many of the displays are as much as any person can mentally digest. It is an epitome of the products and of the producing capacity of the nations of the world, such as has never before been gathered together. It will need not hours or days, but weeks, to even begin to understand it all, so that here we can, of course, give but the barest glance at it, rather than attempt any minute description. As we pass on from booth to booth, we find Spanish and Cuban cigars. From Trinidad we find cases of honey, cocoanuts and essential oils; the latter suggesting, as does also a Vienna

perfumer's exhibit near by, that we have still some undeveloped resources in our own country. If the fair only sets us to thinking of and to utilizing these, it will justify its cost in this alone. Some things shown are merely curios, as a model of the famous Eiffel tower, built wholly of red peppers. Yet we suppose it is meant to have a certain use, as showing the immense production of these in the country, whose display is ornamented by the Cayenne tower.

There are other displays here which do not come strictly under the head of agriculture. One of these is the handsome exhibit of German mineral waters. Still they are a product of the earth, and help to show its wonderful bounty. A booth, devoted solely to Kainit, shows the natural rock, and the salts in all the stages of manufacture. And that this was attracting much attention seemed indicative of the growing interest in the study of commercial fertilizers. An English exhibitor of oatmeal was crowding his American competitors hard, by strenuously declaring that we cannot make good oatmeal in this country, because we do not grow heavy enough oats. It is, of course, a fact that the English oats are heavier, except Rocky Mountain oats, running forty-six pounds per bushel. And if this enables them to make better meal, then we must grow heavier prairie oats. It is of just such suggestions as this that the Agricultural building is full to overflowing.

An English exhibit that attracts special attention is that of the Brookfield stud, one of the leaders in the breeding of hackneys. It comprises handsome models of the grounds and building, and photographs and engravings of the noted performers turned out by the establishment. This display is timely, in view of the fact that hackneys are now growing in popularity among American horsemen. England grows no limes, but they are a product of her colonies, of whose interests she is ever as watchful as of her own. So here we see a fine display of lime-fruit juice, while under the lime trees, in our own Florida, the fruit lies rotting, for want of any use to which it can profitably be put. England and her colonies come out strong in specialties. The British Bee-keepers' Association makes a splendid display of honey and wax, a display that even such a honey State as California might well be proud of. California is usually quick to take advantage of its opportunities, but it might learn a lesson in the Australian exhibit. A few years ago it began to import, and has since been planting extensively, for shade and for timber, the Australian Eucalyptus. Here we now find a display of Eucalyptus oil, which is said to possess great medicinal value. It is prepared from the citron-scented species, *Eucalyptus maculata*, and could, without doubt, be as well grown and manufactured in California as in Australia. It is a curious fact that the other principal feature of this exhibit should consist of Kangaroos; and many will be surprised to learn that the leather made from the skins of these little animals is highly valued. We do not often think of Great Britain, or its provinces, as being among the Indian corn producing countries. But in the agricultural display from New South Wales, corn is used for decorative purposes in such quantities as suggests that it is a very common product there, and highly valued. From the handsome engravings in this exhibit, we also get a suggestion that the people of that far-off country consider their agricultural shows as matters of some consequence to farmers. The parades of fine stock seem of more importance than the horse races. The extent of the wool display, too, almost justifies the title of "Big Sheep Ranch," which has sometimes been given to the country. Cape Colony shows much wool, but it also shows a better product—the fleecy mohair from the Angora goats. And this is another thing that we should not import, as long as our great Southwest is so well adapted for breeding these animals. The Cape also sends a profusion of beautiful ostrich plumes, artistic cabinets of the flora of the country, skins and furs of the native animals, polished tusks of ivory, and savage Kaffir implements and dress. With these are grain, wines and brandies, showing an emergence from the pastoral to the agricultural stage of existence.

Passing now from the extreme South to the far North, we find from British Columbia a grain display that should set at rest any fear of an early shortage in the world's supply of cereals. But on the way we pass through France, where is a display of candied fruits and flowers, that it seems should have been in the Horticultural building, and which, too, should have displayed American enterprise and art, rather than French. Here, too, is a display from the great seed house of Vilmorin-Andrieux & Co., that our own seedsmen will find hard to rival. The great Northwest—Canada, Oregon, Washington, the Dakotas—lead in the grain exhibits. Louisiana bases her claim to consideration mainly on sugar and rice. The Iowa booth is golden with corn. But even a mention of the States must be omitted, for to say what each deserves would require more space than is at my disposal.

In closing this brief review, I cannot do better than to point a moral by a mention of the Orange Free State of Africa—almost the last of the divisions of the earth to come into the rank of agricultural States. From thence are shown wool, and grains, and fruits, not so very much in themselves, but of interest as showing how quickly a wild land can be made subject to man's uses and needs.

TO THE CREDIT OF WEEDS.

C. L. HILL, MINNESOTA.

It is doubtful if any one thing brought more grey hairs to our forefathers' heads than their perennial worry over weeds. The plants that nature so freely sows and favors with such tenacious qualities, could not fail to be a sore trial to farmers who had little more than a hoe and their fingers to work with. No wonder that the sight of a weed, even in autumn, sent a chill to the spine; and no wonder that a feeling of hatred for such offenders became a part of the common legacy bequeathed to the present generation. The result was that we dropped almost unquestioningly into the old way of regarding a "weed" as a thing of unmixed evil, a "robber of the soil;" and it became almost heresy to think otherwise. Even to-day a progressive thinker and investigator who discovers a useful quality in the condemned plants, hardly dares to mention it, lest the popular verdict place him as an advocate of slackness in farming.

A student of the weed problem must impartially consider: 1. The good weeds do. 2. The harm they do. He must also give due recognition to the fact of their existence, and cost of getting rid of them. In other words, the debtor side must show a balance equal to the cost of extirpation before such work can economically be undertaken. In the practical dealings with weeds, they may be separated into two classes; and every farmer draws the dividing line for himself, for there is a wide difference of opinion as to where it belongs. The first class includes those that can be, and should be, entirely eradicated from the farm. To it belong plants that have a strong tendency to monopolize the soil, regardless of its present occupancy, and whose hardiness and tenacity render it difficult to control them when they get a foothold. The Canada thistle is a sample. This class seldom has more than a very few kinds on any one farm. For these plants there is nothing to offer but extermination.

The other division includes the numberless common weeds, mostly annuals, that make but feeble growth, if any, in the field of grain or grass; but which spring up so readily on the vacant spot, or along the intervening spaces of crops planted in rows. The harm these do depends largely on the treatment they receive. In the field of grain or grass, if the seeding was rightly done, the harm is very little. On the vacant spot it is still less, for there is nothing to injure. It is among the hoed crops that their chief harm is done. The damage they do here, if unchecked, is too well known to need mention. But it must be remembered that the period of their harmful influence is necessarily limited to the growing period of the crop. When that period has passed, however thickly the weeds may spring up, they do the ripening crop no harm. The common objection to these fall weeds is on account of the seed they bear. This was quite worthy of the consideration of our fathers with their limited and inefficient farming tools. But modern improvements in harrows, cultivators and weeders are such that the work of keeping down the weeds, during the growing season of a crop, is but a light affair, even after a fall sowing of noxious seed. This is best understood by those who have taken part in the system commonly adopted on the big farms of the Northwest, and who have closely observed the method of no hand work among weeds.

After the large corn field has been planted, the harrow is kept moving until the plants are six inches in height. What matter if the soil is filled with seed of noxious plants, since they have hardly time to sprout before they are put out of existence, by this wholesale annihilator? Then the cultivator is kept running until the corn has nearly made its growth. At this time the ground is practically free of weeds; and every stroke has been done with horses, and at rapid rate. As soon as the cultivator is laid aside, weeds spring up, perhaps make a growth of two or three tons per acre, but what harm? This work of harrow and cultivator is often charged up against weeds, but is the charge a fair one? The progressive farmer well knows that the soil gets no more stirring than is needed for the good of the crop, and which would be needed just

the same if there were no weeds in existence. In regard to being a "robber of the soil," no plant can impoverish the soil if it decays on the spot where it grew.

Among the benefits the soil may derive from a crop of weeds are those accruing from these facts: 1. Weeds shade the soil. 2. They furnish a mulch. 3. They supply vegetation to be plowed under. Just what is the influence of a burning sun on a naked soil is not fully understood. It is generally conceded, however, that it has a harmful effect in some way. In not one, out of several experiments, have I been able to raise more than three-fourths of a crop on soil kept naked and frequently stirred during the previous July and August. The value of a dead mulch is unquestioned by any. In some way both live, and dead mulches favor nitrification in the soil, and the earth is made richer aside from the decay of the covering. Even a cover of boards, or stones is known to bring about enrichment of the soil. Concerning the value of a crop for plowing under the common verdict stands in high approval. Any crop is considered valuable for the purpose. That a crop of ordinary weeds

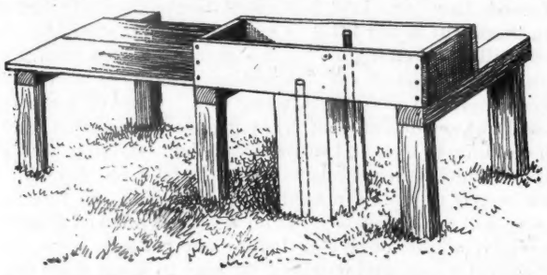


FIG. 1. WATERING TROUGH PARALLEL WITH THE ROADWAY.

is as valuable as one of clover, I do not claim. Yet it is not improbable that some among the miscellaneous growth may be nearly, or quite, as good a collector of nitrogen as the clover.

To place an estimate on the aggregate benefit of weeds would be a difficult task. That it is sufficient to be worthy of consideration, is a fact that can hardly be questioned. On the great Western farms they furnish about all the fertility that is ever received. It is not improbable that they do much more in keeping up the continued richness of soil than is ever credited to them. The fall crop of weeds costs nothing. If a system of agriculture shall make profitable use of them, it saves the hard work of keeping them down. There is also a great saving of worry over conditions that are often unavoidable.

ROADSIDE WATERING TROUGHS.

Whenever practicable, watering troughs should be located at convenient distances along the highway. In some States any one

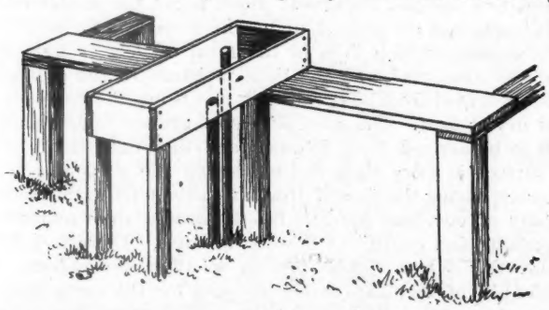


FIG. 2. WATERING TROUGH RECTANGULAR WITH ROADWAY.

of the residents who will establish and maintain a watering trough along the highway is exempted from a certain number of days of road tax. This law proves such a convenience to the traveling public as well as the residents that it should find a place upon the statute books of all the States; however, to aid those who desire to erect the best forms of troughs, the accompanying sketches are presented. In Fig. 1, the trough is placed parallel with the roadway, as often there is no room to extend it in any other direction. Whenever possible let the water enter near the bottom of the trough, as the upward flow keeps the water continually agitated and pure. The outlet or overflow pipe should have its mouth as near the top of the trough as possible, and in no case let the surplus water overflow the trough and run upon the surrounding soil to form mud holes. The plan shown in Fig. 2 will prove more convenient, and should be imitated whenever practicable; its form not only allows both horses of the team to drink at once, but a team may also drive up at the opposite side. This trough need not be over five feet in length, and should be placed four feet from the ground, that horses may drink without being unchecked; however, it is best to provide

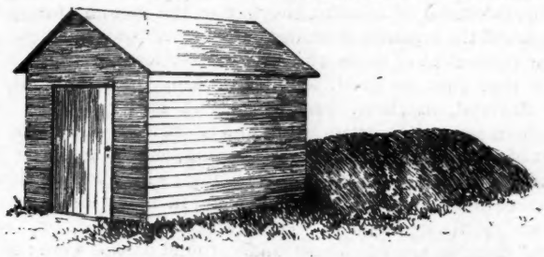


FIG. 1. PERSPECTIVE VIEW OF SUMMER DAIRY HOUSE.

a single plank platform ten feet long upon each side, as shown in the illustration. Often the overflow may conveniently supply a trough in the adjoining field, or be conducted in underground pipes to the farm buildings. In exposed situations, provisions against freezing should be provided. The foundation should be as firm as possible to guard against the trough being moved by horses crowding against it. A well-arranged watering trough adds greatly to the attraction and value of any roadside.

SUMMER DAIRYING IN WARM LATITUDES.

G. H. TURNER, MISSISSIPPI.

A favorable temperature throughout the year is an indispensable condition for successful butter making. If this condition is not properly observed, whatever else may be done, uniform results need not be looked for. A dairy thermometer should, in all cases,

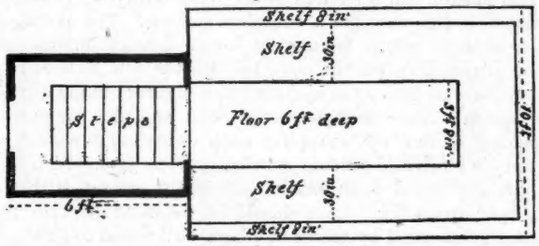


FIG. 2. GROUND PLAN.

be used; no guess work will answer. Throughout the South and Southwest the steady heat of summer necessitates, on the part of the successful dairyman, a place where both milk and butter may be kept cool during the long continued periods of heat. The heat is no greater South than in parts of the North, neither is it more oppressive. It is not hotter, but it is more steadily warm South than North; the soil becomes more heated, the heat accumulates, and the ground does not cool off to the same extent that it does farther north. Where ice is obtainable, it is generally used; but there are many Southern farms preëminently adapted to dairy farming where ice is out of the question. Even with those who can obtain it and rely upon it exclusively, the supply frequently becomes exhausted just at the time when it is most needed. Now the writer can affirm from both experience and close observation that ice, though both useful and desirable, is, by no means, indispensable. "Gilt-edge" butter can be made on almost every well-ordered farm without it. The writer's butter is always a rich, golden yellow, always firm, even in the hottest weather; the surplus is all bespoken at twenty-five cents per pound the year around. No "butter color" is used, but the butter is colored by the cows. The writer's butter is made in a spring house, the water, as it issues from the ground, pure, clear and cold, runs directly into a

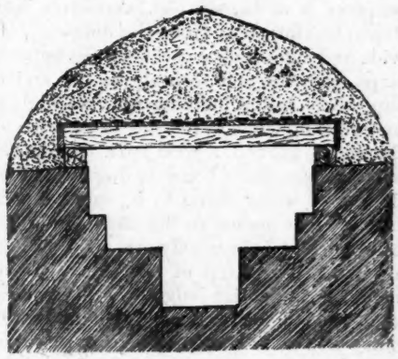


FIG. 3. CROSS-SECTION.

trough eight inches deep; in this trough the earthen pans are set. The milk is strained into these vessels as soon as it has cooled and freed from the animal odor (usually about a half hour after being milked from the cow), and the pans are kept tightly covered with a double thickness of muslin; they set in the trough twenty-four hours, when the cream is skimmed off, ripened and churned.

For the benefit of those who have neither ice nor spring house, I state that just as good, as nice looking, firm, aromatic and finely flavored, in short, just as perfect butter can be made throughout almost the entire South and Southwest, and in the very hottest of weather, without ice or a spring, as with either or both. Several years ago, in an adjoining county, where ice in summer was unheard of, and where springs were, in many localities, conspicuous by their absence, "subterranean dairies," or "storm houses," came in vogue. These underground dairies were used for several purposes, besides keeping milk and butter in, mainly as a safe place of deposit for anything that it was essential to keep either warm in winter, or cool in summer. The following is the method of construction: Lay off ground to be excavated in a clear, shady spot, ten feet wide and as long as desired—ten by fifteen feet is a convenient size. Lay down the sills, eight by twelve inches, and of hard, durable timber, flat side down, before the digging is commenced. Sleepers twelve feet long, so they will come out even with the outer edge of the sills, and likewise be of durable timber, are laid upon the sills about two feet apart, to hold up the weight of the earth excavated, which, when the dairy is completed, is all put back on the planking covering the excavation. The cover should be two inches thick, matched, or the joints covered with some thinner material. A stout plank should be nailed to the ends of the sleepers, covering the entire space between them, and another one on the end farthest from the door, to thoroughly exclude all earth. Although not absolutely essential, it is much better to ceil it overhead, and plaster the floor and walls with cement. Those which are finished in this way are a complete success. The average temperature in these cellars is fully 30° lower throughout the summer than the atmosphere on the outside. Butter can be kept in them in midsummer as firm as in midwinter, while that made during the "flush season" can be kept perfectly sweet and nice for family use the ensuing winter by wrapping each churning separately in a clean muslin cloth and putting it in large stone jars, which must be kept partially filled with brine sufficiently strong with salt to readily bear up an egg. Care should be taken at all times to keep the butter submerged by pieces of plank cut round to fit the inside of jars, and weighting them down.

Six feet in the center is sufficiently deep. Start the excavation ten feet wide, dig down two feet, then leave a shelf of earth all around eight inches in width. This shelf may be used to hold cans of fruits and vegetables, jars of pickles, preserves, jams, or jellies. Then dig down eighteen inches farther, and leave a shelf two and one-half feet wide, also of earth, all around, except at the entrance; this is to set the milk vessels on. The jars of butter may be set on the floor at the end farthest from the door. This leaves the excavation in the center three feet eight inches wide, which, for all ordinary purposes, is amply sufficient. Then dig down until it is six feet deep. For the steps, measure back from where the entrance is to be, six feet, and three feet eight inches wide, dig down, leaving steps from the doorway, also of earth, eight inches wide and eight inches rise until the bottom is reached. Over these steps, and fastened securely to the end sleeper, must be built a snug little frame building six feet high and sufficiently wide and long to completely cover the steps, with small but good sills lying flat on the ground, a good span roof and a tight door. When this subterranean dairy house is dug in stiff clay there is little, if any, danger of water rising in it; more especially if cemented on the inside. It is useless to dig them in sand. After the excavation is completed and the woodwork all finished, the loose earth must be thrown back on top of the plank covering, making a long pile, reaching the entire length of the excavation, sloping enough on each side to shed water. The temperature in these underground dairy houses is comparatively even summer and winter, ranging during the hot summer months from 60° to 68° Farenheit, average temperature 64°.

The plan of suspending the milk in the well can hardly be too strongly condemned. If a small portion of the milk is accidentally spilled in the well, the water for drinking purposes is ruined. If obliged to use well water as a refrigerating agent, draw the water out of the well and use it elsewhere. Ice is too expensive, even at one cent a pound, for those who are not forced to use it. The cream can be hastened to the surface by diluting the milk. This plan is fast coming into use wherever it is known, and in the absence of ice, spring or dairy house is simple, inexpensive, and a saving of time and labor. The milk, warm from the cow, is strained into a can until it is half filled, then fill up the can with cold spring or well water, which aerates the milk and immediately reduces its temperature to about 70°, even in the warmest of weather. All the cream will separate and rise to the surface; the cream may be skimmed from the top, or the combined milk and water drawn off by a faucet from the bottom of the can until the cream appears, which is then drawn off into a separate vessel. Spring houses and subterranean dairies are best for localities remote from railroads. [Our sketches on the preceding page, illustrate in Fig. 1 the exterior appearance of this dairy house, in Fig. 2 the ground plan, and in Fig. 3 the cross section.]

THE FLOWER GARDEN IN MIDSUMMER.

EBEN E. REXFORD.

If weeds have been kept down well during the early part of the season, there will be but little to do with the hoe after the first of August, still it is well to go over the garden at least once a week, and cut off the head of such persistent growers as were not thoroughly decapitated before. A weed is a synonym for perseverance, and unless you cut it off below its crown, or uproot it wholly, it will continue to live, and surprise you by perfecting seed under conditions which other plants would not exist three days in. One cannot be too thorough in fighting weeds. You are fighting for to-day as well as next season. If no weed was allowed to form and ripen seed it would not be long before our gardens were clean of heavy-seeded weeds, and it would be easy to keep them so. But we slip over a weed here and another there, and a very few of them are enough to furnish seed for next year.

This month is often a very dry one. If you want such plants as blossom at this season, be they shrubs, herbaceous or annual ones, to bloom well, see that the soil does not dry out about them. It takes but a little drouth at this time of great and prolonged heat to undo all the work of the spring and summer. Water liberally at night, and mulch well with coarse manure if you have nothing else at hand. If you have a lawn, utilize the clippings from it as a mulch. Grass looks much better than manure about a plant. Dig it in about the roots from time to time, as fresh clippings are supplied, and you benefit the plant in more ways than one, as the decaying vegetable matter furnishes food for the plant which it can make good use of at this time. Dahlias, Cannas, Caladiums, and other plants with thick, fleshy roots, require a great deal of water in order to make a satisfactory development, and if it is withheld now, you check the plants at a time when they are approaching perfection. Dig about them frequently. Some persons, neglect to do this, in a dry season, thinking that a soil stirred frequently must be dryer than one not disturbed. Such is not the case, however. Stir the surface of the ground, and make it open and it will absorb all the moisture which falls in the form of dew or light rains. Allow it to crust over, and the little moisture in the atmosphere will be prevented from penetrating it, and below the crust you will find it dry as dust. The successful corn-grower understands the benefit to be derived from frequent and thorough stirring of the soil's surface in a dry time, and in keeping the garden beds light and porous during the time of drouth we should follow his methods.

Many of our best annuals fail to satisfy after midsummer. The quantity and quality of flowers decrease. There is but little new growth. Why? Simply because we allow seed to form. It is the chief aim of all plants to develop seed for the perpetuation of their species. Allow them to do this and they are inclined to do but little more. But prevent them from accomplishing their desire and straightway they set about making another attempt. Cut off a flower as soon as it fades and the plant that bore it will put forth another branch on which it bears a flower from which it hopes to ripen seed. By persistently interfering with the plans of the plant, we can keep it making attempts to carry out its designs, according to the instincts which nature has endowed it with, and in this way we secure a good show of flowers all through the season. Therefore, if you want to keep your garden beds bright till frost, allow no flowers to perfect seed. Go over them every day and clip off each flower that is past its prime.

If you have put any of your house-plants out in the border, it is time to think of taking them up for winter use. Take a sharp spade and cut down on all sides of the plant, a few inches from the center of it. Let the earth you cut be of about the amount the pot into which you intend to put the plant will hold. This will lead

the plant to put forth new roots inside the ball of earth, to take the place of those cut off, and when the plant is lifted it will have active, working roots, which it will not be necessary to disturb.

THE CLEMATIS.

C. L. ALLEN.

The beauty of vines and creepers, and their adaptation to ornamental gardening, are so well known that words in favor of their use would be superfluous. It may not be generally known, however, that many of the most vigorous and beautiful vines in the world are indigenous to the woods of nearly all our States, growing to the summits of lofty trees, covering walls and fences in the most graceful manner, and creeping over and among rocks, where but little other vegetation will thrive. Vines seem especially adapted by nature to the covering of trellises, screens, or verandas, plant foliage giving the most cooling shade that can be devised.

Among the ornamental hardy climbers, the Clematis occupies a very prominent place. Throughout the summer, many grounds and verandas are bright with masses of the brilliant and variously colored blossoms, which are continuously renewed until the frosts of autumn. More than 100 species are known, being mostly natives of cold or temperate climates. Varied and beautiful as the species are, a large share of their well deserved popularity, however, comes from the ease with which they hybridize with each other, producing so many pleasing combinations that over two hundred garden varieties have proved worthy of propagation, from which may be selected those which will produce any desired effect. Although most of our native species are herbaceous, the large flowering sorts, which were introduced from Japan by Fortune and Sieboldt, can be grown as deciduous climbers, the same as the Wistaria, which adds very much to their usefulness. All this class can be rendered hardy by protecting the new growth one year. For example, take the growth of the present season, which, if the conditions for its development have been favorable, will be at least eight feet. Upon the approach of cold weather take this carefully from the trellis, roll up, without bruising the stems, into a coil, say two feet in diameter, which should be laid over the roots of the plant. Cover to the depth of three inches with newly fallen leaves, these to be kept in place by pieces of board, or by whatever is the most convenient. In early spring, uncover, and fasten to the trellis as wanted. Flowering stems will put forth from the axil of the old leaves. After the second summer's growth, the stems will be perfectly hardy. For covering a large surface the operation can be repeated with the second year's growth, and continued until the plants cover the required space. These are all large flowered varieties, with colors from pure white to dark purple, and, when well grown, more showy objects cannot be found. From seed, a great number of varieties have been produced, but *C. Jackmanni*, a deep purple, and any one of the pure white, double flowering varieties, planted in close proximity, for contrast of color, are all that need be desired. In a favorable season, the growth will be rapid, and the flowers continuous, nearly the entire summer and early autumn; a good rich soil and plenty of moisture will be necessary to produce this result. Among our native species is *C. virginiana*, the Sweet Scented Virgin's Bower, which is much admired for its graceful habit, pleasing fragrance, and poetical association. Its period of flowering is short, but its foliage furnishes a pleasing shade the entire summer. *C. crispa*, a native species, produces an abundance of small flowers of great substance, through the summer. The flowers are a light purple, and very fragrant. *C. coccinea*, a native of Texas, is similar to the above, in manner of growth, and in continuous bloom, but the flowers are brilliant scarlet, and of a globular form, opening but little. These are all hardy, herbaceous plants. The latter should have a slight protection during winter, and be planted in a dry soil. One of the most graceful and charming of the European species is *C. Viticella*, indigenous near the shores of the Mediterranean Sea. The long-petioled, drooping, rose-colored, purple or blue flowers bloom from June to September. A mellow, light loam soil, occasionally fertilized, is best adapted to this species. From China and Japan, however, come most of the large flowering species which adorn our gardens. The list of these and their varieties is so large that it would be difficult to make a selection. [In the accompanying illustration of a group of Clematis, the pendulous blossoms of *C. Viticella* are shown at the left, the upright flowers of *C. coccinea* are above, with the sturdy *C. Jackmanni* beneath.]

THREE BEAUTIFUL CLEMATIS.

HOUSEHOLD

Canning Fruits and Vegetables.

S. E. WILCOX.

In the canning of fruit and vegetables, heat is not applied to expel air, but to destroy the invisible germs of decay, with which the atmosphere abounds, especially during the season of ripening fruit. It is not the air which causes fermentation and decay, but the presence of these bacteria. Any amount of pure air may be imprisoned in cans, and the keeping quality of the contents not be impaired if these germs have been previously destroyed. Sterilized cotton fiber, which admits the air, but filters out the germs, will protect the fruit as well as the tight metal top.

On Fahrenheit's thermometer 150° marks scalding heat, and it has been demonstrated that these germs cannot exist in a temperature of 140°, hence, it will readily be seen that fruit heated beyond 140° is heated just so much more than is necessary to secure its preservation. Many soft fruits do not retain their shape when boiled, but fall to pieces and become pulpy. The housewife to whom this has been a great annoyance, will be glad to learn that it may be avoided by heating the fruit to only 140° F., if kept at this temperature for some time. It will do, however, to remove fruit from the fire at 140° and fill and seal cans in a lower temperature. One hundred and forty degrees can be maintained over an ordinary cooking stove. This can be verified with a thermometer. The process should be completed in this temperature. A can not full may be sealed and opened, and filled at any time in an atmosphere of 140°. In the ordinary method fruit must be hot enough to destroy the germs as they fall upon it from the surrounding atmosphere, but if heated and sealed in an atmosphere of 140°, they are already destroyed. An ordinary dairy thermometer can be used to ascertain the temperature.

Rhubarb or pie plant, green gooseberries and green currants can be kept without cooking. Fill cans with sliced rhubarb, gooseberries or currants. Wash with hot water. Pour off and then cover with water previously canned boiling hot, and kept sealed until cold. Shake well to favor the escape of air bubbles before screwing on the cover. Or, pour boiling water over gooseberries or green currants and let them remain until cold; drain the fruit and fill cans as full as possible, then pour over fresh boiling water. Be sure that the water quite covers the fruit, then seal immediately.

Cut ripe grapes in clusters of three or four, fill cans carefully with them, and cover with cold boiled water, which was hermetically sealed while cooling. Whole clusters may be placed in cans, the cans then immersed in water, and the covers screwed on under water. Great care must be exercised in either of these methods, that no grape is loosened from its stem, for upon this depends the success of the process.

One's store of cans is quite apt to become filled in the late autumn. Fruit will keep for a long time, if heated and covered by pasting over the top several thicknesses of paraffine paper. This paper is an excellent covering for jelly. Cut it to fit the top, and press over closely before putting on the cover of the jelly cup.

To can grapes whole, heat the cans very hot by placing them over cold water and let them remain until the water boils, or by setting them on a paper in a cool oven and gradually raising the temperature. When hot, sway them completely in a soft towel or cloth wrung from warm water. Fill with stemmed grapes, and pour over them boiling water, seal, and let the cans stand ten minutes, then pour off all the water possible, and fill with rich boiling syrup, and seal. Grapes put up in this manner have a different flavor from those canned by any other process, and retain their shape. The skin of only a few at the top of the can will break. Raspberries, blackberries, etc., can be preserved in the same way.

Strawberries may be canned cold by using for every pound of fruit a pound of granulated sugar. Let the fruit and sugar boil up once, then place on platters or deep pie plates, and set in the sun until thick, which will be in about twenty-four hours. Keep the plates covered with mosquito netting. Can without heating. This makes a delicious conserve. Cherries and currants are delicious prepared in this way.

Pears may be steamed until a stiff broom splint will pierce them easily, then place the fruit in cans, and cover with a rich syrup, to every quart of which has been added a teaspoonful of tartaric acid dissolved in a little water.

Rhubarb or pie plant is to be sliced and baked in an earthen baking dish, adding a very little water at first. When about half done, add sugar liberally and stir lightly. When tender, can. The sauce is a rich color, the pieces are entire, and a very fine flavor is secured.

The tops of cans should be screwed down occasionally before they are cold, after which they should not be disturbed. All canned fruit must be kept in the dark. This is imperative. Tomatoes should be put in paper bags, or buried in sand.

Appropriate Parlor Ornaments.

HELEN M. PRATT.

Many an otherwise pretty room is injured, even ruined, in its effect on the observer by the number or quality of small ornaments placed on mantel or table. Many a parlor mantel is so crowded with china and glass that it resembles nothing so much as a pantry shelf. In such a medley, the beauty or novelty of any single object is quite obscured. Before you have time to admire it, another attracts your eye, and the effect of both is lost. A few pretty ornaments, a framed photograph, a curious bird's nest, a unique bit of rock, a pretty cup and saucer, may keep company, but give them ample space, and if your collection of interesting ornaments is large, put some of them on the retired list for a while. They will be all the more enjoyed when they are again brought out to view.

Unframed photographs should not be placed on the mantel, as they are almost sure to fade and warp, and in framing them it is always desirable that they should be covered with glass. The former custom of arranging mantel ornaments in pairs, has been abolished, and now if one possesses two vases of the same pattern, especial pains are taken to place them irregularly, or in different parts of the room. On the mantel only is diversity of color permissible, and this liberty should not be abused. If you have not enough ornaments that are really pretty enough to win attention, be content to leave vacant spaces until you come into possession of something worth holding up for the admiration of your friends. The hideous pictures and gaudy glass and china ware that are now manufactured in such quantities, are painful to the eye, or should be, and serve only to lower the taste of any family who may use them for ornamental purposes. On a small table, place a dainty book, a new magazine, or an interesting photograph for the entertainment of a caller who may be kept waiting, but do not leave here your choicest articles of perishable china, unless the table be heavy so that there is no danger of upsetting.

In summer, potted plants, mosses, or cut flowers, may be used to beautify any room. Good books and good pictures give character to the plainest apartment, and in these days, when the works of the best authors are to be had at small expense, and when carbon photographs, copies of the best works of art, may be procured at small cost, there is little excuse for bare walls and empty bookshelves. In the country there are countless beautiful objects supplied by the hand of nature for indoor ornamentation. A handful of beautiful dried grass, the silver silk of thistles, or milkweed, irregular branches from the trees of orchard, or forest, glistening rock fragments, pebbles from the brook which may be kept under water and bordered with moss, clusters of small cones, or of leaves painted or gilded, and scores of other trifles are all ready for the hand of the interested seeker.

Windows in Summer.

Every window should have outside or inside blinds, but every window does not. Where these are wanting use a dark olive green shade on a spring roller, and across the lower half of the sash put up curtains of dotted swiss. The most durable way of putting up sash curtains is on a small brass rod, but a tape or picture wire run through a shirr in the curtain and fastening to a small brass screw hook at either side will do very well. These sash curtains help in keeping out flies, although they are not so good in that respect as wire screens.

Care of the Hands.

Everyone cannot have beautiful hands, since Nature is not equally lavish in her gifts, or, at least, since she does not bestow the same gifts upon each, but everyone can have well kept hands. It is not necessary to have a costly manicure set, nor costly lotions and creams, nor to spend much time. There should be a shelf over the kitchen sink for housekeepers, and those whose duties require them to wash dishes or to wash their hands there frequently. On this keep a good quality of toilet soap,—any almond meal, glycerine or oatmeal soap by a good maker,—a piece of pumice stone for rubbing off stains, a little dish or box with borax for softening the water, and a small bottle of vinegar. If your hands are roughened and reddened by the use of coarse kitchen soap, pour a few drops of vinegar on them and let it dry in. The acid will neutralize the alkali in the soap. If, in addition to this, you wash your hands frequently, always pushing back the skin at the base of the nails with the towel when you dry them, and keep a bottle containing two ounces of glycerine and one of rose water handy, pouring two drops on the hands each time after washing, while wet, you will have soft and fairly white and presentable hands, no matter what work you do. Stains can be removed by adding a few grains of chloride of lime to the water. Keep this in a tightly covered tin box. Small curved scissors for cutting the nails, a small chamois polisher, and a bit of sandpaper for removing the grime under them, are the only tools belonging to manicure sets which are really essential. Use no pink paste for artificial coloring of the nails, and trim them to a nice oval instead of to a point. It is this systematic care, which need not occupy five minutes a day, which produces the best results.

In the Woman's Building at the Columbian Exposition.

EUPHEMIA WINANS.

There are many opinions about the exterior of the Woman's building at the World's Fair which has had applied to it various adjectives, including "timid," "ladylike" and "magnificent." But there is only general admiration for the beauty and interest of the interior. The great hall of paintings, shown in the illustration, is surrounded by arched galleries, in themselves an object lesson in proportion. Mrs. Mac Monnies' now famous painting, "The Prehistoric Women," may be seen above the two tiers of arches at one end. At the other end is Miss Cassatt's representation of modern women. In the cases on the floor of this main hall are shown laces, rare embroidery, and other artistic work. The rooms on all sides of the hall of paintings are filled with general exhibits and those of foreign countries. In the galleries above are the rooms furnished by the different States, the wonderfully interesting Nursing exhibit of Great Britain, several large assembly rooms, and the Model Kitchen, a contribution from the Illinois Board.

The visitors to the Woman's building have widely differing objects in studying the exhibits there. Earnest workers are learning in the labyrinthine alleys of the Organization room how Temperance Unions are carried on. Other women care more about the work of women in practical design, and still others give most of their attention to the paintings and porcelain. The vast majority of our countrywomen, however, take a greater interest in the countless details which will help them in their especial work of homemaking than in any so-called wider field.

The Model Kitchen fascinates all these housekeepers with its clean prettiness. The kitchen is a platform at one end of a large assembly room. Its floor and wall are covered with small white tiles, the wainscotting bordered with blue. The range is that ideal in such matters, a good gas range, with room for plenty of pots and pans, and an elevated oven. There is perfection in the way of an icebox, and a portable sink which shows how handsome and convenient a sink may be. A hanging flour bin, which turns with a crank and

sifts the flour, and a dresser well furnished with the blue and white Dresden stoneware which no housewife of discrimination can see without coveting, also help to furnish this highly desirable kitchen.

As to house decoration, the rooms of the Woman's building afford innumerable helpful hints. The Library, which is the New York Board's contribution, is a valuable lesson in its scheme of color and choice of material. Not every woman would have thought to use green linen for the portieres, which accord so well with Mrs. Keith's decorations, but any woman who sees those curtains there may perceive how perfectly such a simple stuff can carry out the right effect. The beautiful tones of cream color in the Connecticut room are another suggestive study, and the frieze of June roses in the Cincinnati room will doubtless be an inspiration to flower lovers. It is to be hoped that women architects will note the pleasant effect of such of these state rooms as open upon the handicraft in the Woman's building that is most striking. The cloak fashioned by an American farmer's wife from 3,000 prairie hens' very best feathers, the lace knitting of the Shetland Islands, as fine as frost pictures upon a window pane, the oriental embroideries on cobweb-like linen, the exhibits of the Royal School of Needlework in London, the black gauze draperies from Siam, which it must have taken years to embroider in their intricate designs of a thousand tints—all these have in common the womanly quality of "keeping everlastingly at it." The Woman's building was meant to help in proving what that brave quality may be worth once fairly trained.

Keeping The Little Folks Well.

ANNIE HAMILTON DONNELL.

Not making them well by many dosings and nursings, but keeping them well from the beginning, so that the medicine closet can be kept in the background, in blessed disuse,—that is what I mean. And it is not only a possible thing but a probable one, as well, when certain laws are strictly obeyed and certain rules staunchly adhered to.

A child begins life under the serious disadvantage of having no choice in the matter of his own coming weal or woe. It is not for him to say whether his future life shall be a model of strong, healthful manhood, unimpeded by abused physical laws, or a disheartening struggle, from beginning to ending, with a weak constitution. The wee fellow sucking his thumb in his cradle is entirely at our mercy, but he has a royal right to demand a good start in life, at our hands, and what better insures that end than a slow, sure building up of a perfect constitution, through the years of his childhood and boyhood? So-called kindness and loving indulgences may altogether defeat the end in view. I have in mind the case of a boy whose arrival at years of understanding was the beginning of a long series of discouraging conflicts with a weak stomach and all its attendant, cruel evils. Possessed of a fine constiuution by inheritance, it became undermined by a long course of affectionate indulgence, and the total lack of any attempt at physical dicipline. It was pure love that set the ball rolling, but, once under way, it was a Herculean task to stop it. So love defeated its own ends, and a boy's life merged into a man's under terrible disadvantages. The case is one of thousands. How shall we give our own children the health that is inestimably above wealth, on the threshold of their independent existence?—Well, the question answers itself in the two old, familiar words—"Eternal Vigilance." We must enlist in a constant warfare, and I think the most decisive issue of all has to do with eating and drinking. A child who is allowed to eat indiscriminately, and whose menu includes cake, candy and "rich" concoctions of any kind that overtax the delicate little organs of digestion, may as well make up his mind to a dyspeptic's unenviable career at some time in his future life. It is inevitable, unless he has inherited an iron-clad stomach from some merciful great-grandfather. Candy and cake have *no* place in a child's bill of fare, and the only safe rule to adopt is total abstinence. If there is never a taste of "forbidden fruit" allowed, the little man or woman suffers not the least, in mind, from his deprivation, and gains inestimably in body. I know a little lady who has never tasted candy or cake, and who has not the slightest desire to do so. She has never been sick in her life, save for several light attacks of illness incident upon teething or unavoidable exposure. Her meals are made up of the most nutritious elements of food, with all the useless and harmful elements entirely absented.

I cannot attempt to give, or undertake the responsibility of giving, a list of foods for little people's fare. If one does not understand the laws of health and the laws of food as applied to health or non-health, then it is a sacred obligation to put oneself into immediate possession of such knowledge. We owe it to our children as

INTERIOR VIEW OF THE WOMAN'S BUILDING AT THE WORLD'S FAIR.

the fine loggia of the building. A similar arrangement would improve many commonplace upper stories.

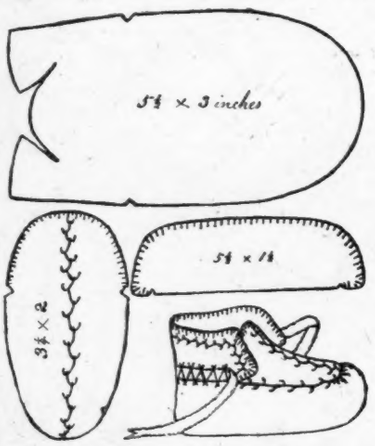
The different exhibits of dolls in the Woman's building are captivating. A Paris society for the encouragement of needle-work shows in the French section a group of dolls illustrating characters in history from the fifth century onwards. They are the prettiest possible of little wax statues, and every detail of the costumes is carried out with the minutest care. The milliners and dressmakers of Paris have another exhibit of costumed dolls, and there is a constant stream of enthusiastic people before th delightfully practical dolls of the nursing exhibits, especially that of Great Britain, where not only are the nurses shown, probationers, ward nurses, in every sort of gown from navy blue cashmere to white muslin, and stately head nurses in stiff black satin, but the poor, suffering invalids are likewise on exhibition, with painted gore issuing from their waxen wounds, which are of every conceivable variety. Perhaps, after all, it is the endless patience of

surely as we owe it to them to study their soul's welfare. Body and soul go hand in hand; and human wisdom fails to define the boundary-line where one separates from the other.

Regularity of diet is well nigh, if not quite, as essential as the wise choice of foods. Lunches, as the term is usually understood, are temptatious of the evil one. When there is, unavoidably, a specially long interim between two meals and the times do not vary, it is sometimes a necessity, and a wise one, to introduce a half-way meal for little hungry mortals, whose simple food digests more rapidly than our grown-up fare. But let the half-way meals be regular in time and quantity and quality. Ordinarily, lunches are wholly unnecessary and wholly harmful.

Baby's Chamois Shoe.

Choose a nice, smooth piece of chamois skin and cut out the several pieces exactly according to the diagram. Join up the heel, sew the front to the



PATTERNS FOR BABY SHOES.

lower portion according to the notches, gathering all the extra fullness in at the toe, then join on the back. Buttonhole the edges with colored twist, and feather stitch all the seams. Tie in front with baby ribbon. If desirable the shoes can be made much higher, in which case cut little slits above the ankle and run in baby ribbon to tie in front and draw up snugly about the lower part of the limb.

Match Holders.

Attractive match holders are always in order and those who cannot buy gems in Cloissoné, or Sevres ware may be pleased with the two here

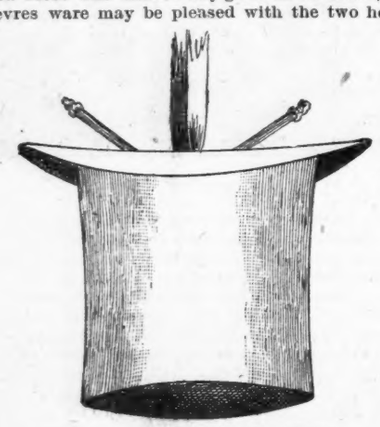


FIG. 1. A HAT MATCH RECEIVER.

illustrated, after sketches by Dorcas Eyelet. For the unlighted matches make a little hat of cardboard like Fig. 1. Cover it with silk or satin, or crochet with ecru cord, and stiffen with shellac and varnish. Or stiffen first with glue and then gild or silver it, or enamel black, when it will resemble Neapolitan straw. Place inside a little glass jar or a tin baking powder box, and hang up by ribbons.

For the burnt match holder, cut two pieces of card board, canoe shaped like Fig. 2. Glue birch bark neatly on the outside. At the underline, overhand together and fasten on ribbons for hang-

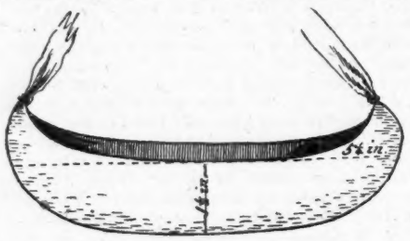


FIG. 2. A CANOE BURNED-MATCH RECEIVER.

ing it by. Inside put a miniature canoe of tin, made by simply fastening two pieces of tin together at the bottom like an inverted V.

Some Pansy Trifles.

DORA HAMILTON.

The illustrations given herewith suggest dainty little gifts that are appropriate at any season and for any purpose. They are made of parchment paper, whose rough surface is artistic in itself and especially effective for decoration with water-colors. The photograph-case (Fig. 1) is simply an envelope of the parchment, with a square "flap." A row of pansies is painted upon the edge, and their lower petals cut out carefully, so that the little flowers themselves seem nestling together in a row. A bow of ribbon of some harmonious shade can be attached to one corner, and the device is complete. The bon-bon box (Fig. 2) is a flat box neatly put together. The lid is made a little wider than the

FIG. 1. PANSY PICTURE CASE.

FIG. 2. PANSY BONBONNIERE.

bottom so as to permit of a narrow projection down over the front, and upon this the pansies are painted, their lower petals cut out as in the picture-case, the bend in the lid coming just at the line of their upper petals. The photograph holder (Fig. 3) is made first of paste-board and covered with the parchment. Any design of pansies may be used in its decoration, and arranged about the oval center to suit one's taste. The corners are sprayed with a gold paint-wash—shaded deeply at the points and lightened out toward the center. Water-color paper may be used instead of the parchment, as the painting, in either case, is done in water-colors.

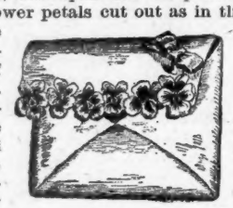


FIG. 3. PANSY PHOTOGRAPH HOLDER.

For a Bridal Gift.

SISTER GRACIOUS.

She was a bonnie January bride, and her godfather gave her an exquisite bunch of roses, but as buds are buds in winter with the thermometer marking zero, the lovely bouquet tied with its broad pink satin ribbon broke a hundred dollar bill in two. A few days after I ran in to see the bride in her cosy new home and found her looking at the now faded flowers with a serious face. "What is the matter, dear?" said I. "I was just wishing godfather had given me plants instead of this thing, for I shall have to throw it out in a day or two, and that will be the end of it. Just look at that sunny window! Now suppose he had bought a wire stand and placed on top a lovely feathery palm, with below a maidenhair fern and some roses and lots of bulbs, and perhaps a rubber plant. I do not believe all of them would have cost a cent more than these cut flowers. When sister Jule gets married next year—she is so fond of plants—I'll give him a hint. Brides get tired of all the bric-a-brac and silver that falls to their share. They say it is going to be fashionable to give dogs, cats, and poll parrots to brides, but rare plants are a great deal more beautiful."

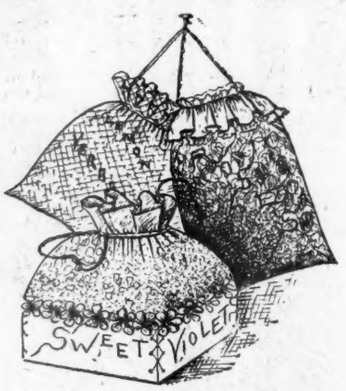
The Tulip Dress.

The accompanying illustration represents a dress for a child three years old. It is made of pale blue chambrey, combined with fine valenciennes lace, with a round yoke of the chambrey two inches deep, at the bottom of which are two ruffles, each edged with valenciennes lace, and headed with a single row of feather stitching. The lower ruffle is four inches wide, while the upper one is but three inches, both being confined under the same band. The neck is finished with a half-inch band of embroidered insertion, above which is a ruffle of the lace. The sleeves are slightly full at the armhole, and are also gathered to a band of embroidery at the wrist, which are trimmed with ruffles of chambrey, edged with lace to match the shoulder. Leave a margin on all insertion for a narrow band of featherstitching. Finish the bottom with a six-inch hem and three small tucks. The back and front are exactly alike, with the exception of the opening at the back, which is closed with fine pearl buttons or gold studs.

TULIP DRESS.

Flower Sachets.

A pretty little article for a fair or bazar is shown in our sketch. It is composed of three little sachet bags made of scrim or wash blonde, filled with



SACHETS FOR FLOWERS.

dried rose and other sweet leaves. The thinner the material the more readily do the contents shed their sweet fragrance. The violet sachet is made from a small pasteboard box covered with violet silk, with a border of the flowers embroidered or painted about the edge, and finished with a silk bag at the top. They are to be filled with dried leaves of the flowers, as indicated. Fill the bag for rose leaves with petals of different colors.

The Bird's Garden.

GRACE LYMAN.

Perhaps you have a canary that trills forth many a song, and you long to give him something fresh, remembering how eager he was for a crisp bit of celery or lettuce. But in the winter you may not have these, so why not start a bird's garden? There are several ways, some very pretty as well as useful. A damp sponge hung in the window and planted with bird seed will, if kept moist, be a bright green ball, and if birdie be let out of his cage, he will fly to it eagerly, pick the green shoots and sing you a song of thanks. Or, it may be a saucer garden, by planting seed in it at different times, you can keep it green all

winter. But the prettiest of all is a carrot garden. Find a fresh looking one, dig a hole out of the center, and keep it filled with water, and the green sprigs will be very grateful to birdie. A sweet potato can be treated in the same way, only this will be a vine and run up the strings by which it is fastened in the window. I saw a very peculiar bird's garden once. A hole in the bottom of the cage led down into a glass globe; this was surrounded by a glass tank filled with water. A Chinese lily was planted in the water in the outer tank. Looking through, you could see the bird in the inner globe or hole, but it looked as if he was flying around among the lily leaves and buds.

For Midsummer Days.

The time for white frocks and outing suits has come! The two are combined in the tailor-made gown of snowy piqué, in which the stylish maiden frolics on mountain tops or by the "sad sea waves," and for the same purpose is employed the new figured piqué covered with small geometrical designs, dots or *fleur de lis*, outlined with black or color; these are said to retain their freshness three times as long as those of entire white. They are made up with a slightly gored skirt, plain in front and the moderate fullness gathered in the back. A short Eton jacket, with medium large puff sleeves, flaring, notched revers, and a row of buttons on each side, opening over a low cut, double-breasted vest fastened with removable pearl buttons held by rings on the under side. A stiff linen chemisette, with standing collar and a four-in-hand tie, complete this costume; or the vest may be discarded and the jacket worn over a blouse that has soft silk or mull jaboted down the front. There is no trimming on these gowns unless a few rows of stitching are fancied, or a bias band of the piqué.

Sailor hats will, probably, be most used with these cotton outing suits, but the very chic thing for the country is a low, flat-topped visor cap fashioned from the dress material and decorated with a white cord fastened by gilt or white enameled buttons. One dollar is the price charged by tailors for making these, while white shoes and white chamois gloves, that can be washed again and again; or tan shoes and tan gloves give the finishing touch to these natty toilets.

Nothing looks prettier and cooler on a warm summer evening than the dainty flowered organdies. They are prettiest when simply made, having tiny ruffles clustered at the foot of the skirt and a full shirred waist confined by a bodice of silk that exactly matches the figure in the airy fabric. The surplice waist is extremely popular for all cotton goods, from cheap ginghams to expensive muslins, as is also the scarf blouse with loose Marie Antoinette fronts, which are crossed, wound about the waist and tied in a large bow at the back.

Inexpensive lawns—blue, pink or corn color—are charmingly girlish with a yoke and bertha of white guipure lace, deep guipure cuffs below puffed sleeves, with a wide girdle and bow of black velvet ribbon. There is no collar, the scallops of the lace coming up closely about the throat. Indeed, it is a season of lace, yards upon yards of it being worn, and it often appears as insertion on gowns of silk and crepon as well as on batiste and muslin. The two-inch width is usually employed, and as it is a good deal of work to really insert it, as it should be, many content themselves with half effects, by sewing strips of straight edged guipure on skirt or waist. On the latter it crosses from armhole to armhole, simulating a yoke. Extremely narrow lace edging often heads folds or bands of ribbon. For very thin dresses, Mechlin and Limerick laces are chosen in preference to guipure.

With the expansion of skirts, accordion plaiting has been once more revived, and is particularly liked for grenadines. Thus, a black gown of this fabric is finely crimped with the selvage running around the skirt and is lengthened by a flounce of French lace which is, also, plaited and falls over a deep ruffle of the grenadine set on an underskirt of colored Surah silk. The corsage and sleeve puffs likewise show the plaits, while wide bretelles of the French lace cross the shoulders, and a black satin girdle encircles the waist. Most exquisite fancy bodices are also formed of accordion plaited black *mousseline de soie* made over fitted linings of black or gay hued silk, and worn under beaded jackets. Such waists are beautiful trimmed with Nile green velvet, sprinkled with jet cabochons, to wear with a skirt of thin black crépon speckled with pale green. The elbow sleeves should be of pin-dotted crépon. The silk-lined skirt displayed a twenty-four-inch flounce headed by a green velvet band studded with jet. This skirt was quite wide, but, as a rule, the absurdly large skirts seem to have had their brief run, and we have settled down to modified forms of the early spring fashions. The veils used this summer are longer and looser than for several years past, covering the entire face, being drawn up on the sides and pinned at the back. It is claimed that the expression of the countenance can be altered by the arrangement of the veil; the folds running upward giving a pleasant expression, and downward the reverse.

In these days of pocketless gowns, some may be glad to hear of a useful and picturesque concomitant to a country costume. This is a satchel of bright red, blue or green cloth on which an effective design is appliquéd and coarsely outlined with double gold thread. This is large enough to hold a book as well as handkerchief and purse, and makes a pleasing touch of color against a white or a dark dress.

Seasonable Dishes.

Those who live in large cities or upon farms can command the fresh vegetables that make a summer table so healthful and delicious. In villages, however, one must make the most of the small plot of ground that he may be so fortunate as to own. A very small bit indeed will suffice for the raising of the soup vegetables and herbs which it is so hard to procure freshly gathered, and which it is so great a convenience to be able to pick in one's own garden. Soups without meat being light, and at the same time nutritious, are especially adapted to a summer diet.

Julienne Soup.—A properly made Julienne is one of the best of these summer soups. Two young carrots, one new turnip, two small onions, a leek, a cupful of shredded cabbage and some stalks of celery or celery top, are the necessary ingredients. There are special machines for cutting these vegetables after they have been scraped and pared, into the match-like bits of which the Julienne of the French kitchen is composed, but the busy housewife will put all together into her chopping bowl and mince them fine; fry in a hot saucepan in four ounces of hot butter until they turn yellow, but do not permit a suspicion of scorch. Now if you have a quart of water in which peas or beans have been boiled, pour it over these fried vegetables, or a quart of hot water and a gill of peas or beans, and let it simmer three hours; add a couple of tablespoonfuls of minced sorrel or lettuce leaves, or one of parsley, a cup of rich hot milk or cream, and turn into the tureen over little squares of fried or buttered toast. This soup is richer, but still delicate, if made with thin veal or chicken broth instead of water.

Green Pease Soup.—Shell a peck of green peas, reserving a half cupful to use as directed below. Put the rest into a saucepan with four ounces of butter, a head of lettuce, a small onion and a few leaves of spinach; add a teaspoonful of salt and simmer until soft, letting them simply steam in the butter; press through a sieve and dilute with two quarts of equal parts of water and milk, or three pints of milk and one of cream; bring to a boil and thicken with a teaspoonful of cornstarch, or two of flour dissolved in cold milk; add the peas which you reserved and which have been boiled until tender and drained.

Onion Soup.—A soup of new onions is greatly liked. Fry a cupful of sliced onions in two tablespoonfuls of butter; when a light brown add two heaping tablespoonfuls of flour, and when this is browned and cooked a little, three cups of boiling water; simmer thirty minutes, and add a cupful of smoothly mashed potatoes reduced to a creamy consistency with a cupful of hot milk; strain through a fine sieve, let it boil up and pour over bits of toast.

German Vegetable Soup.—The "kartoffel-suppe" of the Germans requires a handful of chopped chives to be boiled for ten minutes in half a pint of water; add a quart of milk, and when at the boiling point, pour half of this over a pint of mashed potatoes that have been well beaten with a tablespoonful of butter and a seasoning of salt and pepper. Press the potatoes through the colander and add all to the remaining soup mixture; bring to the boiling point and add two eggs beaten with a cupful of the hot soup until all danger of curdling is passed. Pour the soup in the tureen at once and serve.

Tomato Soup.—A vegetable soup, made with tomatoes as the principal ingredient, is most excellent, and there are a number of different ways of making it. A cupful of minced carrot, turnip, onion, leek, celery and parsley in proportions, varied to suit the maker, can be first fried in two tablespoonfuls of butter and then cooked for an hour before adding a quart of fresh or canned tomatoes, when simmering must be continued for another hour. Then thicken with two tablespoonfuls of flour and press through a sieve. Season to taste. Or, you may omit frying the vegetables and simply simmer them. Another way is to add a pint of hot milk to a quart of stewed, thickened and strained tomatoes in which you have dissolved half a teaspoonful of soda to keep the tomatoes from curdling the milk.

Asparagus, celery, corn, lima beans, potatoes, rice, oyster plant and many other vegetables make delicious cream soups. They are all made in pretty much the same manner. For a corn soup grate a pint of corn from the cobs, boil the latter in three pints of water for half an hour, remove them, add a pint of hot milk and the corn; simmer until soft; thicken with three tablespoonfuls of butter and two of flour rubbed together; strain, bring to the boiling point, and add the yolks of two eggs beaten slowly with some of the hot soup.

Lima Bean Soup.—Boil a quart of very young Lima beans for thirty minutes, changing the water once, and adding a tablespoonful of butter to the second; press through a colander, add a pint each of hot milk and veal stock, or a quart of milk and the butter, flour and eggs as before.

Sterilized Milk.

MAY SILVERS.

Where infants must be brought up by hand the question of the preparation of their milk or food in summer is a serious one. A congress of the most noted physicians have agreed that sterilized milk is the best food for babies, but the apparatus for sterilizing is an expensive one and the time required for its preparation, together with the care of the bottles in which it is done, is a serious tax on the time of the mother who must do her own work. Dr. Leroy M. Yale, has declared that the common kitchen double, or farina boiler, will answer every purpose. Let the morning's milk stand three hours in a cool place, then dip off the top, using only about half the quantity set; put this in the top of the double boiler and let the water around it boil for half an hour. One advantage of this milk is that it will keep longer without turning sour. It is best to prepare a sufficient quantity at once to last 24 hours.

Little Savings in the Kitchen.

KATHERINE B. JOHNSON.

If crackers are stale or moist, sprinkle slightly with salt, and heat in a moderate oven.

Dry the leaves and left over stalks of celery, and keep them in a self-sealing glass fruit jar, to flavor soups with.

Don't pay five cents more for flour in a cloth sack, when you can buy more and better cloth for the same amount of money.

Don't throw away a lamp-wick as soon as it is short, but wash it, baste a strip of white muslin to the lower end and use it a week or two longer.

If hard soap is taken from its wrappings and stood edgewise on a shelf in a warm room, or put in a bag and hung behind the kitchen range for a few weeks, it will last decidedly longer than otherwise.

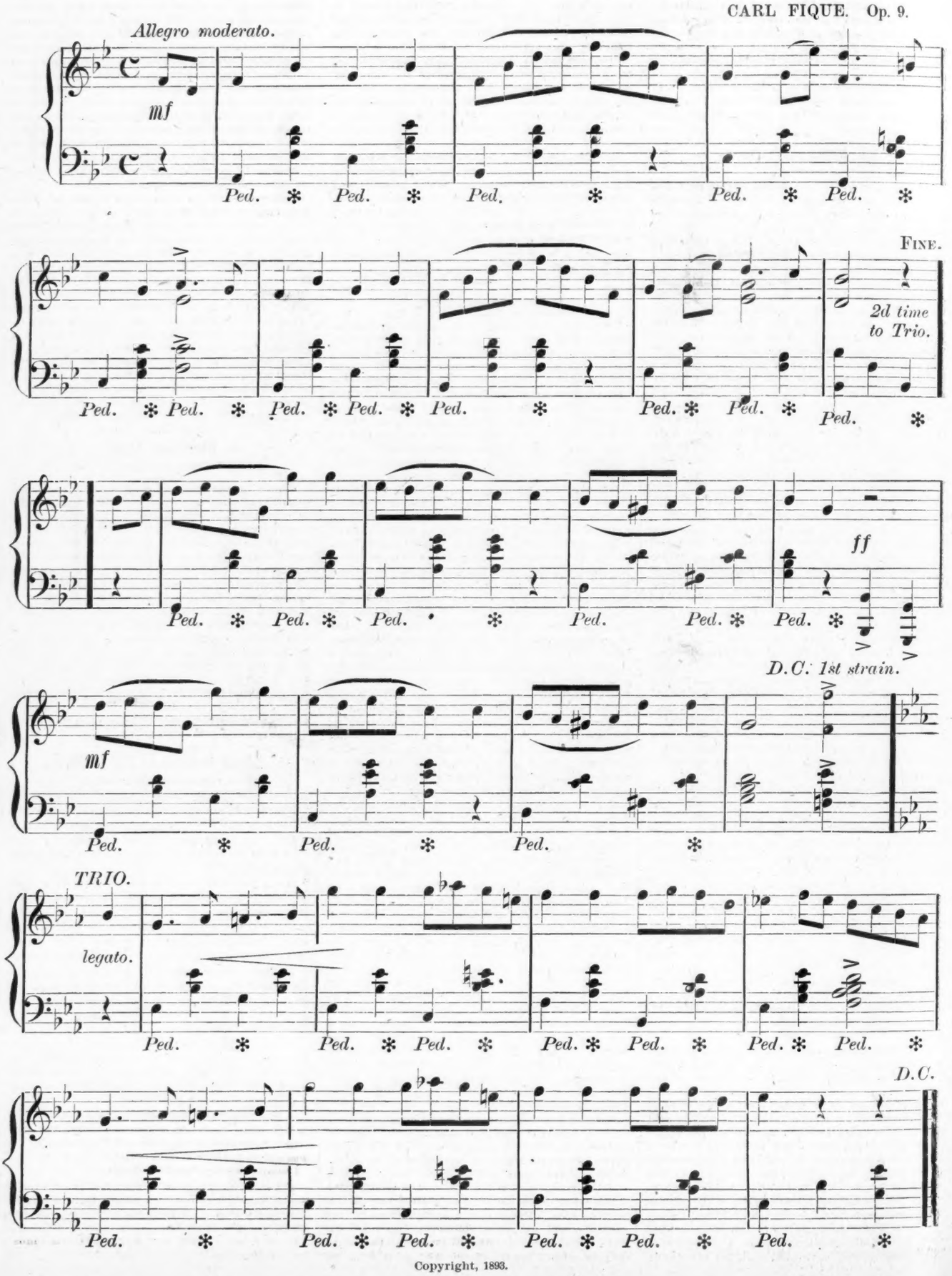
Every ounce of suet, fat, cold meat and bones should be saved and utilized for making croquettes, hash-soup, drippings, or soap-grease. Break the bones before stewing them for soup, so that the marrow may escape.

A teaspoonful of molasses or soft soap, added to a saucer of blacking, which has been wet with vinegar, makes a first-rate stove polish, and the stub of an old broom does better and quicker work than an ordinary blacking brush.

The syrup left from sweet pickles or canned fruit, should be kept and added to mince-meat. The syrup from pickles needs no further preparation, but that from fruit should be scalded, and put in a glass fruit jar. Several kinds can be mixed together.

WRITTEN EXPRESSLY FOR AMERICAN AGRICULTURIST.

CUBAN RUSTIC DANCE.

CARL FIQUE. Op. 9.

Allegro moderato.
mf
Ped. * Ped. * Ped. * Ped. * Ped. *
FINE.
2d time to Trio.
Ped. * Ped. * Ped. * Ped. * Ped. * Ped. * Ped. * Ped. *
ff
Ped. * Ped. * Ped. * Ped. Ped. * Ped. *
D.C. 1st strain.
mf
Ped. * Ped. * Ped. *
TRIO.
legato.
Ped. * Ped. * Ped. * Ped. * Ped. * Ped. * Ped. *
D.C.
Ped. * Ped. * Ped. * Ped. * Ped. * Ped. *

Copyright, 1893.

The Magenta Satin Frock.

ISABEL GORDON.

First of all, I must tell you how I came to have such a thing when I was twelve years old, for my mother was so plain in her tastes that satin for me would, under ordinary circumstances, have been quite out of the question. One Christmas, when I was about eleven years old, father and mother went up to London; and when they returned she had the loveliest pink satin, which father had given her for a Christmas present.

I remember seeing mother wear the dress several times, and beautiful she looked, only now it would seem very quaint, just as our fashionable dresses will be thirty years hence. It was made with wide sleeves and trimmed with some sort of white gimp; her hair was laid in flat bands down her cheeks, and a pink rose peeped from behind her ear. The last time she wore it was at a grand wedding, where she had it ruined by a decanter of wine being upset in her lap.

Next day mother and Nancy rubbed and sponged and ironed it, but it was of no avail, so in despair it was laid away. Some weeks afterwards Aunt Kate was stopping with us, and I heard mother tell her of the accident.

"You ought to have it dyed, and made into a frock for Sara," she said.

"Why, I never thought of that," replied mother, "and, besides, I do not think I should like to dress my little girl in satin just yet."

"Well," said Aunt Kate. "If you do not use it soon she will have grown so that there will not be enough to cover her."

How wide-open my eyes grew to think of a real satin frock, which had come all the way from London! One of the girls at school had a blue china silk, and we all envied her, but this was so rich and fine and heavy that the china silk would be quite eclipsed.

Next day mother and I called at the dye-house, where I always loved to go; it was such a queer old place, which had stood there by the town bleaching green for more than a hundred years. Through the building rushed a tiny brook, with little bridges across it; then at the quaint gable end it came tumbling out, roaring down the race as if mad to be off, to glide and wind round the smooth bleaching green, growing clean and pure before it reached the little river beyond. The dyer showed us sheet after sheet of sample colors, and mother let me pick out what I wished. I chose a lovely, rich cardinal.

In ten days my satin came home, and you can imagine my disappointment when I found it changed to a vivid magenta. From a second visit to the dye-house, we learned that the man had jotted down the wrong number opposite our order, and though he was sorry enough, could do nothing to help us, for he said it would rot the stuff to dye it a second time.

Day by day, as I watched my dress grow out of it, I began to think the color less hideous, and before it was finished I was quite content. It was so much lovelier than anything I had ever dreamed of having. It was low necked, and for sleeves had immense puffs on the shoulders, the waist hooked behind and was joined to the skirt, which was trimmed with two rows of black velvet ribbon. But how proud I was of it, and how I did long to wear it!

SARA AND MISS JASPAR.

Early in April, father and mother decided on going to travel on the Continent for two months, and till their return I was to be sent to stop with grandmamma. The week before they started, Miss Margaret Shoolbraid, an old friend of mother's, came to visit us, and, as she was going back to Fochabers, where grandmamma lived, it was decided that I should go with her. Very eagerly I watched every preparation which was made for my departure, but none with such interest as when my trunk was being packed. (The funniest little trunk it was, covered with hairy, mottled skin, just like the hide of our old gray Dapple; and all studded with brass nails.) Right on top went my satin frock, for, as mother said, there might be some parties given where I could wear it.

Miss Shoolbraid sat by while the packing was in progress; and to her mother gave some instructions about my clothes. "Margaret," she said, "won't you please see that this little girl does not put on her satin frock whenever she feels like it. If she has one failing, it is that she would like to wear her best clothes every day."

Miss Shoolbraid promised, as if she meant it, for which I did not love her any better. None of the Fochabers girls were very fond of her. They called her a prim, meddlesome old maid, but she had always been kind to me, and mother was much attached to her. Still I was very willing to listen to anything they said.

When I had been at Fochabers for a week, I had an invitation to a "cowslipping" picnic in the White Ash woods, and for days I looked eagerly forward to that Saturday morning.

At last it dawned, bright and lovely. When I came downstairs to breakfast, I found that grandma had gone away in the night, to stay with a sick friend, and that she might not be home until the next day. She had left word that I was to wear my old brown calico, and be sure to come home before the dew fell. So said Jean, grandma's hired girl, as she gave me breakfast and put up the lunch I was to carry to the woods.

Presently I went upstairs to change my frock, and the first thing I saw when the wardrobe door opened was my magenta satin. How I did long to wear it!

The girls would not be ready to start for an hour or two yet; so I donned my new frock, and, like the vain little peacock I was, bobbed and smiled and courtesied at my reflection in grandma's long, swinging mirror. "Oh dear! if the girls could only see me now!" I sighed, and then, "Why shouldn't they!" The wish was so audacious, it almost sent a chill through me, but I was vain enough to be bold, for I wanted to show little country girls how we dressed in the city. So I decided to keep it on. I tied my hair with a magenta ribbon, wore my broad leghorn hat, trimmed with white ribbon and pink roses, drew on my new white gloves, and I was all ready to go cowslipping.

I waited and peeped till I saw Jean walk leisurely down to the milk house, with her shining cans, then I darted downstairs, found the little lunch basket in the pantry, and sauntered up street, to meet the girls.

I can imagine now how astonished folks must have been who met me that early morning. I saw

some turn their heads to look after me, but I thought then it was admiration. Near the corner of the square I met the girls, in their plain school dresses, clean pinafores and cotton sunbonnets, and how very fine I did feel beside them, and how they admired and wondered and exclaimed over my costume!

There were two roads to the White Ash woods. One led up the village street, past where the Shoolbraids lived; the other wound around for nearly a mile further, a green country road, skirted by hawthorn hedges, most of it a steep hill. I begged so hard to go by the long road that finally the girls consented, but I did not tell them it was because I was afraid of Miss Shoolbraid's sharp eyes catching sight of me.

At last we reached the woods—the loveliest woods I ever saw—and cowslips were everywhere, fragrant and luxuriant, nestling daintily among their tender leaves, till the braes were fairly yellow with them. Then we found great tangles of ferns, patches of blue hyacinths, a few early violets, here and there a buttercup, or a frail maidenhair fern; and everywhere the lovely trailing linnæa.

And yet, amid all the loveliness, I was not happy at all. I knew I had done wrong. Besides, I could not race up and down the green braes, as the other girls did. The merriest kind of a time they were having; scrambling through the bushes, diving down into swampy places, in vain search of early ragged-robins, or leaping across tiny

BEFORE THE BIG MIRROR.

brooks, while I—I had to go slowly and carefully, on account of my fine clothes. Before we knew it, the forenoon was almost gone, and lunch time had come. But we had no dainties, such as you children go a pienicing with; no rich cake, or pie, or pickles, or sardines, or any such thing; nothing but thick, puffy scones, thin wedges of buttered oat cakes, a bit of cheese, a tiny pot of black currant jam, and a big bottle of rich milk. After lunch, we lay still there, talking, singing, and having the most delightful time, for I had almost forgotten the trials of my finery. Our resting place was a tiny green plateau; in front of us a wide avenue, cut in the trees, stretched to the edge of the wood, so that from where we sat we could look away down the village street, broad and shady, ending at the bridge which crossed the wide Spey, the most rapid river in Scotland.

It was very still in the village; nothing to be seen moving but one little pony carriage, creeping up the road. We lay there and lazily watched it coming nearer. There was one lady in it, and as she reached the foot of the hill, she waved her handkerchief to us.

"Why, it is Miss Margaret Shoolbraid," cried Jean, "and she is driving up here!"

My heart seemed to stand still, for I knew in a minute that she had come after me, and before the girls could speak I was off, scampering like a rabbit down the hill, jumping brooks, tearing through bushes, tumbling down the steep braes. When I reached the top of a ferny knoll, I looked back, and could see Miss Margaret and the girls coming after me. I resolved I would not be captured. I could reach home by a long, roundabout road, through the fields and down by the river, so I started off in that direction.

I got safely over one fence, and had almost crossed the field before my pursuers left the wood, but when I reached the end of it, there was a wide ditch, through which trickled a muddy brook. I could not go back the way I had come, for Miss Margaret and the girls were over the fence, and would reach me in a few minutes. There was no bridge till I came out on the road, so I determined to jump, and one flying leap brought me right in the mud, my dress caught on the thorny brambles which lined the bank, my hat fell into the water, and myself was as miserable a little girl as ever lived. At last I got free, and scrambled up the bank, waiting to be taken into custody.

"Well, Miss Sara, I hope you have enjoyed leading us such a dance! Now get up and come home with me. A pretty looking figure you are; every rag on you ruined! I just hope that this will teach you a lesson. And in the middle of this harangue, Miss Margaret treated me to some rather vicious little shakes. The girls stood by, looking half sorry for me, and yet very much like giggling, for I must have been a funny little figure.

"Come right home with me this minute, Sara Elizabeth, and I hope your grandmother will give you such a whipping as you never got in your life before." Mother always called me Sara Elizabeth when I had been unusually naughty, and now Miss Margaret remembered it.

On I trotted ahead of them, wet, draggled and miserable. A big lump seemed stuck in my throat, but I could not cry. Miss Margaret flecked at me once or twice with her little carriage whip, as she marched behind, like a policeman I had once seen taking a man to jail. The girls followed, and not a word was spoken till we reached the high road, where Jerry, the fat brown pony, stood with the Shoolbraids' dainty phaeton. "Now, little girls," said Miss Margaret, "finish your day's fun, and you need not say a word about how foolish Sara has been; but I do not want you to forget the lesson she has taught you, that fine feathers may make fine birds, though not always happy ones."

Miss Margaret covered the pretty blue velvet cushions with her linen laprobe, and set me in carefully, so that my dirty clothes might not soil anything.

I was so cross and unhappy that I kicked the dashboard spitefully, till Miss Margaret stopped

SCAMPERING LIKE A RABBIT DOWN THE HILL.

to shake me again, and I was so miserable I burst out crying. "Cry away," she said, "it will not hurt you."

At last we reached the Shoolbraids' home, a big gray stone house, with funny gable windows peeping from every corner. All around was the loveliest garden, with its wide lawns, tall forest trees, gay flower beds, and the dearest, queerest little summer houses, buried in roses and honeysuckle. I had spent many delightful hours roaming in the grounds, but to-day I was too unhappy to notice their beauty.

We passed in under the stone arch, where a row of wicked-looking wolves' heads grinned on top, then Miss Margaret drove around to the back door, and told me to go to the kitchen while she took Jerry to the stable.

As soon as I entered, old Betsey exclaimed in dismay: "Losh preserve us, Miss Sara! but whaur hae ye been? Sic a sicht as ye are, wi' your bonnie new frock blauded sae its dane for, an' yoursel' black mud up tae the very een. Did ye gang wallupin' through a peat moss, or whaur hae ye been?" I could not answer her, for by this time I was crying like to break my heart; ashamed, repentant, and in terror as to what might be in store for me.

"Whisht, whisht, bairn," said Betsey, soothingly, "your claes 'll clean again, dinna greet. Puir wee lass, I hope you'll never hae a waur trouble than this ane."

She had taken off my muddy shoes, and was washing my face when Miss Margaret appeared. She told me to stick my feet into a pair of huge carpet slippers, and then I shuffled after her into the bright little parlor where her aunt sat.

"There," said Miss Margaret, curtly, as she turned me round and round. "There, Aunt Jasper, what do you think of this? Did you ever see such an object? If she were my child, I'd give her such a whipping as she would not forget. I had just driven out at the gate to go calling, when I happened to see a speck of magenta away up in the wood, and I knew in a moment it was this child with her Sunday frock on. I started for there, but when she saw me, off she scampered, and such a chase it was! I suppose I should have been running still if she had not rolled into that nasty ditch at the end of Thompson's field. Serve her right, too. If it had not been for spoiling her clothes, I should not have been a bit sorry. I

declare I *would* like to whip her." "Gently, gently, Margaret! Hush, do! Poor little soul, she has been punished enough already. Sara, come here." And next moment I was in Miss Jaspar's arms sobbing out all my sorrow and penitence on her shoulder, while she patted and stroked my head so gently that it seemed as if my troubles were fading away, till Miss Margaret's sharp voice recalled them.

"Take your dress and skirts off immediately, Sara, till I see what can be done with them. I feel responsible to your mother for all of this."

Very wofully I undressed in Miss Jaspar's lovely blue bedroom, and Miss Margaret was preparing to pin a tartan shawl around me when her aunt exclaimed:

"Stop a minute, my little coronation frock would just fit her, and nobody has worn it since I did fifty years ago."

"Nonsense!" snapped Miss Margaret, "you will only be fostering her vanity and be giving her a good time, when she ought to be punished."

"She feels sorry now, Margaret," said Miss Jaspar, gently. "There are different ways to punish people, both big and little."

When Miss Margaret whipped my clothes over her arm and went downstairs, I drew a long breath of relief.

"Now tell me all about it, my dawtie," said Miss Jaspar tenderly, as she drew me close to her. Then between my tears I whispered the whole story—how I had never worn my satin frock before, how I longed to show it to the girls, how lovely it looked hanging there when I went to get my old brown calico, how I had tried it on, and been tempted to wear it to the woods.

Miss Jaspar went up attic for her coronation frock, which I wore until I went home. It was a rich ruby velvet trimmed with old yellow lace and made oh, so funnily.

I sat curled up in the broad window seat, looking out on the beautiful garden, while Miss Jaspar told me story after story, but the one I liked best was of how, when she was about my age, she had one with her father and mother in the very dress I had on to see the coronation of George IV. It was a very grand event, and one which few little girls witnessed, but Miss Jaspar's mother had once been a lady in waiting at court, and a special invitation to little Helen Jaspar was sent by one of the court pages. She showed it to me, a big, yellow document, with an immense seal on it, and it seemed almost as grand as if I had been there myself.

Miss Jaspar's father had been an admiral in the British Navy, and she showed me all the curiosities he had collected from every country in the world during his voyages of forty years. Hideous grinning idols which Chinamen had worshipped, great branches of coral, shells so delicate I scarcely dared to touch them, the dearest carved little cabinets from India, stuffed birds and animals I had never heard tell of before, the queerest creatures in alcohol, jewelry made from shells and fish scales, carving from Japan like bits of delicate lace, Indian shawls, brocades and Turkish embroideries all wrought in silver and gold, cases of quaint old spoons, exquisite inlaid work, queerly illuminated manuscripts, mats and baskets and fans woven by Indian women, cunning little clay pots and bowls from Mexico, so many things it would take an hour to tell you of them, and, as you may guess, the afternoon passed very quickly. I did not realize that it was five o'clock when Miss Margaret walked in with my clothes fresh and white, the satin frock with scarce a mud stain on it, shoes, stockings and gloves spotless, and my hat cleaned and straightened, as if by magic. All the hard feelings for Miss Margaret vanished in a moment, she was so good, in spite of the shakes and scolding, which away down in my heart I knew I richly deserved. When I tried to thank her the tears came again, and, before I knew it, she had me in her arms, kind and gentle as Miss Jaspar herself. How sorry I was then that I had ever called her "an old maid," or laughed with the girls over her odd little ways. Clasping her hand tight, we went down to supper, in the long, cool dining-room, sweet with mignonette and the breath of rose leaves which had faded years and years ago.

The tea table was lovely with flowers, golden daffodils in a peacock blue bowl, roses from the conservatory, and tall Easter lilies in a frail glass vase. We drank our tea from tiny cups Admiral Jaspar had brought from China, with funny red and gold dragons sprawling around them. We had delicious little rolls Betsey had baked, thin slices of jellied tongue, orange marmalade, like liquid gold, wafers and honey, pound cake, and grapes which gleamed like amethysts. When tea was over, we went into the drawing-room, which to me seemed like some lovely fairy land. I looked over folios of rare pictures, peeped into wonderfully illustrated books, dissected Chinese puzzles, and all the while Miss Jaspar played sweet, old-fashioned Scotch melodies. Once upon a time she had been a very grand singer and fine musician. She told me how, years ago, she had sung many a time before the royal family at Windsor, and her piano was a gift from Queen Victoria, who said she could sing the ballads of Scotland as they had never been sung before.

Long ago she had lost her singing voice, but to me her playing seemed to have words, as in "The Land o' the Leal," or the "Banks an' Braes o' Bonnie Doon," which throbbed out all their pathos in music, rollicking, laughing words as in "Duncan Gray," or the battle cry of an army marching to war in the "Men of Harlech," and many another into which she poured all her soul.

I shall not soon forget that day, or the lesson it taught, and my talk with Miss Margaret as we drove home in the starlight.

How Charlie and Nellie Escaped.

S. H. PLATT, M. D.

Crash! Thud: thud:—CRASH!! "Whoa, Billy, whoa!!" and Dr. Williams cast a quick glance from his frightened horse to the side whence the crash came. He was just in time to see two wrecks, and reining his horse around in the wide roadway, he sprang out, tied him to a sapling and saw at once that as he had been leisurely turning the corner, a bicycle, at terrific speed, had wedged between the spokes of his hind wheel, been lifted in its revolution and hurled a shapeless mass upon the road-bed.

But the rider? Ah, he was the other wreck. The doctor stepped hastily to the side of the mangled boy and saw the frightful gash in the top of his head which had been made as he was shot against the carriage, and from which the blood was streaming. Gently lifting the insensible form, his practiced eye discovered that the second thud upon the ground had dislocated his shoulder. It was easy to slip the riding jacket enough to put his hand upon the boy's heart, and find that it was still beating. Then with the kindness that was characteristic, he sprang to his buggy-case, extracted bandages and needles, and within two minutes had three stitches closing the scalp wound, and was about to replace the shoulder when he found that the arm was broken also. Quick in thought and actions, he cut a section from the pneumatic tire of the cycle, and directly had the bone in place and the arm bandaged. Then placing his knee under the arm, snap went the shoulder back into the socket.

"Hillo there, 'pears to be suthin' the matter!" called out farmer Jones, pulling up on the further side. "By Jimminy, if that ain't Charlie Badgers! Say, Mister," (to the doctor) "that's the best boy in this 'ere town, and what I want to know is how came it?"

"Well, friend, I'm glad you have happened along. I've patched him up as well as I can here, but now he must be cared for. He ran into me, wheel caught in mine, and this is the result. Now where is his home? I am a stranger, just passing through."

A tear dimmed the eye of the farmer. "Poor Nellie, it'll a'most kill her! She's his sister, and they ain't got no folks. No, nor hum. But cum right along o' me. There ain't no room to spare in my house, but Tom Jones never went back on a suffring feller critter yet."

"Hold a moment, Mr. Jones. Help me to pour a little of this stimulant down his throat. There now, you take his feet and I will lift his head, and we'll lay him right in your wagon. Now drive on slowly, and I will come on after. But first let me get my lap robe and horse-blanket and wrap up his naked arms and limbs. Now go ahead."

Nellie, from a neighbor's, saw them drive up and take out the limp form and bear it within, and in an agony of anxiety rushed over, and was met at the gate by Mr. Jones, who just opened his long arms and took her in as he said, "Be quiet as ye kin Nellie. He'll be round all right by'n by!"

"So this is Nellie, is it?" thought the doctor, gazing with undisguised admiration at the lovely girl. "Well, Nellie, Charlie has been badly shaken up, but he'll pull himself together in a couple of weeks. And now you must be nurse."

Then motioning Mr. Jones aside, he drew from him the fact that Charlie's father and mother, universally beloved, had both been carried off by consumption, within the same year, and had left the seeds of the terrible disease in the make-up of both the children. Charlie's heroic struggles to school and clothe himself and his sister, and the unselfishness of both, had given them a large place in the hearts of the community.

But the wise ones shook their heads. Charlie's slender chest and Nellie's brilliant precocity and unusual delicacy, foreboded ill. Charlie had known it all, and with a masterful resolve had determined that both he and Nellie would harden themselves against the disease. Hence by enormous sacrifices he had bought a lady's wheel so that Nellie might have her turn with it, then, with a do-or-die determination, he had drilled in all weathers, raced to the verge of exhaustion, and finally crashed into the doctor's vehicle in a victorious home-spurt that caused him to look backward for an instant just as he turned the corner to see his defeated rival turn back in despair.

"It is 15 miles out here, but I will be here at this hour to-morrow," and giving Nell some parting directions, the doctor was gone.

Those were 15 miles of thought and prayer as the good doctor lived over the 20 by-gone years and saw again the babes, the prattling children, the boy and girl just opening out into gay manhood and womanhood; then tossing fevered forms; then encoffined bodies, the solemn burial, and the long, slow dreadful two years of loneliness.

"May be God has given me back my children in disguise!" he cried. So the good wife thought, too, and when the doctor went the next day, it was to ask the homeless ones to his own home.

In due time Charlie and Nellie were introduced to their future mother, who had been instructed to give them both some practical lessons in anti-hereditary hygiene. The first lesson was on the points of weakness.

"Now Charlie, a man five feet five should blow 206 cubic inches on the spirometer; and Nellie, a girl five feet three, should blow 143 cubic inches.

"Here is a spirometer, Nellie, just fill your lungs as full as possible and blow as hard and as long as you can through this tube, and that will force the index-rod up, and just where it stops the figures will tell how many cubic inches you have blown in. Ninety-five, is that all? My dear child, you have found one point of weakness already. Now Charlie.—One hundred and sixty! Dear me! Well, it's a wonder you pulled through!

"Now let us calculate a little. Every ounce of food that we eat requires over four cubic inches of air to burn it up in and expel its products from our bodies. Every grain of food that we eat beyond that, is another source of weakness. Nellie, your 95 inches entitle you to less than 24 ounces a day, while you ought to have at least 36. And Charlie can only utilize 40 ounces when he ought to use over 50. I think that you both have eaten your full supply, and that is another source of weakness, because the surplus above what the oxygen could consume has been poisoning the blood. But, if you have only eaten what the oxygen could dispose of, that too is weakness, because it is far short of the natural need.

"You have both, also, exercised to exhaustion, under the supposition that thus you would preserve your strength. But it is a law of our nature that exercise to the point of feverish tire wastes strength. And another harmful effect of it is to diminish the disposition to use the whole of the lungs in respiration, and by that means absorb still less oxygen.

"In Charlie's case, too, he had adopted the half hoop, or right-angled racing posture on his wheel, which contracts the chest, and strongly tends to diseases of manhood that hasten the approach of consumption. In Nellie's case severe exercise has been persisted in at those times when nature call for less rather than more exercise, and thus diseases of womanhood have been invited, that otherwise hasten on the dreaded consumption.

"By your own confession, too, Charlie has stayed out late nights in order to get his needed exercise, and Nellie has waited, and thus both have been deprived of the sleep, which is the first condition of nervous energy, as *nervous energy is the only safeguard against consumption.* In Charlie's case, too, nervous energy has been

reduced rather than increased by the inward congestions resulting from the exposure of his limbs in the bicycle suit while riding."

"Oh, Mother!" (and at the mention of the word tears gushed into the eyes of both the children at the recollection of the mother lost, and from gratitude that another had been found), "how foolish I have been."

"If I had only known, I might have saved Nellie so much!" exclaimed Charlie, throwing his arms about his sister's neck.

"Yes, but God's ways are not as our ways. You did the best that you knew, and that has brought you here." And with a sob of mournful joy she gathered both to her great, womanly heart, and they felt that, with her wise instructions and motherly care, they might yet bid defiance to the grim destroyer. And they did.

The Autobiography of a Tomato Worm.

PROF. CLARENCE M. WEED.

My earliest remembrances carry me back to a time when I found myself a perfectly formed caterpillar inside a little white shell. By means of my tiny jaws I gnawed through this shell, and crawling out discovered that I was on a great green surface, which has since proved to be a tomato leaf. Soon after I saw a caterpillar much larger than myself on a neighboring leaf, and when he discovered me he said:

"Hello there! little one. You've hatched at last, have you? I'm glad of it, for I've been lonely lately. I used to have a friend called Dickie, and I'll name you after him, if you don't object. "You see we do not have to learn to talk, like boys and girls do, but understand each other from the first." I answered my neighbor that Dickie seemed a good name, and asked what his name was. "Oh!" he replied, "I am called Cattie, which is short for caterpillar. You ought to eat some of that leaf."

I was very hungry and gladly followed Cattie's advice, gnawing away at the green surface of the leaf for a long time, until, finally, I could eat no more. Then I rested and looked around at everything until it grew so dark I could not see. When, finally, it grew light again I was so hungry that I went to work at the leaf, sometimes talking with Cattie, who told me many sensible things about the dangers I was to pass through. On the fourth day I began to feel cramped as if my body was growing too large for my skin. This feeling of tightness increased until, a day or two later, my skin split along the back, and I crawled out clothed in a new skin that had formed beneath the old one. In this new suit I felt much more comfortable than before, and after resting awhile to get a little used to it, I began eating again with fresh vigor.

I led a quiet, happy life for the next few weeks, chatting, occasionally, with Cattie, who told me that one dusky evening a large, beautiful moth [Fig. 1] flew about the tomato patch and deposited on a leaf the egg from which, a week later, I hatched. As soon as the moth laid the egg she flew away, and had not been seen since. He also told me that if I lived I would some day turn into a moth like my mother, though I found this hard to believe until one day a third tomato worm came to see Cattie and told him he was going to bury himself in the soil. Sure enough, he burrowed down out of sight right under our noses. I asked Cattie what he did it for, and he said that when our neighbor had burrowed down a foot or two he would form a hollow cell in the ground, and soon change to the chrysalis state in which he would be quiet and take no food. Then in the spring, after the frost is out of the ground, he would emerge from his chrysalis state, and then crawl to the surface, in the form of a moth, and fly happily over the fields in quest of the nectar of flowers upon which he would feed.

One fine morning I saw Cattie being greatly tormented by a little black fly that lit upon his back, and, in spite of wrigglings and writhings, punctured his skin with a fine needle-like instrument. The fly kept at him for a long while, and when he finally flew away had made nearly fifty punctures. Cattie seemed very sad, and sorrowfully told me that he was a doomed caterpillar; that the fly had inserted a lot of eggs in his body, and that the eggs would hatch into grubs, which would grow at his expense, and finally kill him.

FIG. 1. TOMATO WORM MOTH.

Poor Cattie! from that day he seemed to realize his doom, and grew more and more disconsolate. A few weeks later the little grubs that had been developing at Cattie's expense all gnawed through his skin, and each spun upon his back a small white cocoon. The unfortunate worm had barely life enough left to stay on the tomato leaf, where he looked very queer covered with the cocoons of the parasite [Fig. 2]. A few days later he died and fell to the ground, and soon after I saw a little hole being made in the end of each of the white cocoons, and from each came forth a little black fly like the one I had seen make the punctures in poor Cattie's back. I thought they were getting too numerous for comfort, and so I crawled down the stem of the tomato plant and hid beneath some leaves until they had all flown away. Then I climbed the stem and began feeding again. During these weeks I have been growing rapidly and have shed my skin several times. I have escaped many dangers from birds, beasts and men, and now feel that I must soon go into the ground to pass through that wonderful change which shall make me so beautiful that I shall no longer be called a "horrid, ugly thing," but shall be a handsome moth [Fig 1] with strong wings, by means of which I can fly where ever I wish, and a long coiled tube that I will use in sucking the nectar of flowers. That will be a happy time for me, and I shall be called the five spotted macrosilaor sphinx moth.

FIG. 2. TOMATO WORM, WITH COCOONS OF PARASITES.

American Soubriquets.

Those whose lines are cast in Alabama are termed Lizards; in Arkansas, Tooth-picks; and in California, Gold Hunters in memory of the gold fever of '49, which sent a host of Eastern men surging to the Pacific coast. The shrewd Yankees of Connecticut have been dubbed Wooden Nutmegs from a jocose accusation that they palmed off wooden nutmegs for the genuine article, and in spite of the fact that their domain is known as the "Land of Steady Habits" on account of the moral character of its people, while the inhabitants of Delaware are called Musk-rats, and the State itself the Blue Hen.

Why Ralph Threw The Rice.

Little Ralph went with mamma to see Sister Lotta off on the train. It was a very warm day, and the ticket agent, the baggage master, the conductor and the passengers (the latter as seen through the side windows of the train) all looked tired and cross. Suddenly, just as Lotta was getting in the car, Ralph threw over her a great handful of rice, then another and another. All the tired looking train people began to look interested, and then smiled.

"Ralph," said mamma, "what in the world are you doing?"

"Throwing rice over Lotta for good luck, same's you did Cousin Lou," said Ralph.

"But, Ralph," said mamma, that was at a wedding. People don't throw rice except at weddings."

Then Ralph knew he had made a mistake, and looked very unhappy.

"Never mind," said Lotta, turning back to kiss him, "it means just the same to Lotta."

Then everybody smiled and thought what a nice sister Lotta was.

The Profit of Defeat.

LUCY E. KEELER.

Failure does not mean final defeat. Washington's brilliant career had its beginning in the inglorious march and sad reverses of Braddock's defeat. Disraeli resolved when the House of Commons burst into laughter at his maiden speech to "make them listen sometime." Freeman wrote his histories better for having gone through an unsuccessful parliamentary contest. Locke, banished as a traitor, wrote his "Essay on the Human Understanding" in a Dutch garret. "The Epic of Spain" was written without the aid of paper, on scraps of leather, as the stout fighter and voyager snatched any moment from that wild warfare.

Our very lack may be our advantage. He who is blind has the keenest touch; the crippled body bears often the profoundest intellect. Accident is only God's part in the matter; and apparent failure should only prompt us to higher work.

Storied Words.

Mugwump has been taken bodily from John Eliot's old Indian bible, where it translates our word for a great leader like Joshua or Gideon. *Stalwart* merely describes some worth stealing, a Saxon war term, meaning a fine soldier worth taking captive. *Salary* at first meant money given to soldiers to buy salt with, and in the same way *emolument* was an allowance of meal. *Biscuit* keeps alive the Latin "bis coctus," meaning twice cooked; and *vinegar* is simply the French "vin aigre," sour wine.

See God Dancing.

The other morning the little valley in which we live was all in shadow, and on the Eastern hills the sun was brightly shining. But the fast, heavy

clouds passing over the mountains cast quick shadows over their bright summits, and made a really beautiful spectacle. Frankie was greatly impressed with the scene.

"O mamma, mamma," he shouted, jumping up and down in delight, "do come here *quick!* See God dancing over on the mountains!"

John Duffer.

When I was a young fellow at college, I used to spend my summer vacations with Aunt Dilly Blake. It had always been her constant delight to amuse me with stories of a queer miserly acting neighbor. The last time, however, she did not speak of him until I one day jocosely referred to the subject.

"Ye needn't speak that way of him agin," said my aunt severely.

I looked at her amazed.

"He ain't a miser," continued my aunt. "He's jest odd."

"Whew!" I exclaimed, remembering her former tales characteristic of the stingiest, crossest, crankiest person I had ever heard of in real life.

"But all the things I told ye about him air true," went on Aunt Dilly, "unly they wuz all one-sided. He *wouldn't* give a penny to the poor Roaches when they got burnt out, an' he made Johnny Rowe's pa pay for the greens he took out o' his yard, an' he snapped up people who crossed his lot, an' a thousand other things eq'aly as mean. The truth on't is, ye couldn't tell meaner tricks 'bout enny pusson livin' than ye kin 'bout John Duffer. But there's somethin' else to tell 'fore ye find him out," Aunt Dilly took off her glasses musingly rubbed them, and put them on, took a pinch of snuff from her little box and continued.

"Wal, I found him out one night. 'Twas jest after Enos Cross got drownded in the crick where he'd went in swimmin' early one Sunday mornin'. He wuz a good meanin' man, Enos wuz, but shif'less, turrable shif'less, an' his wife 'n children wuz left poorer'n Job's turkey. We all took up a subscription, an' the very poorest give *somethin'* —'taters, or clothes, or money, whichever they could. But John Duffer wouldn't give one blessed thing. The parson, he talked to him pritty severe, an' John got mad an' stuffed his fingers in his ears. Ev'rybuddy talked awful 'bout John then, jest awful.

"Wal, one night 'twas darker'n pitch, an' drizzlin' like. When I left the house to go to the village store, I heard a queer kind of a grunt in the nex' yard. I stud still an' peeped. There was John Duffer bent all up with carryin' two immense baskets on his arms. 'Bout that time some one wuz goin' by in a team, an' he scooped down an' hid behind the fence. 'Ha, John Duffer,' I thought, 'ye're up to no hones' trick sneakin' round like that.' I was awful indignant rememb'rin' all his mean tricks an' stinginess, an' I determined to foller him up.

"Guess what he did with them baskets? Put 'em on Enos Cross's steps an' pounded on the door, then skidaddled. I found out there wuz all kinds o' eatables in them baskets, an' a lot o' caliker an' sech things. An' I found out that somebuddy unbeknown had done the same things to the Roaches when they wuz burnt out, an' that Johnny Rowe's pa found a peck o' onions on his steps the very night he had that big fuss 'bout Johnny takin' of Duffer's greens, an' lots of similar things. I jest put two an' two together an' went over to John Duffer's. An' I jest give him fits and arst him what in the world he meant by sech onnat'ral conduct.

"What d'ye 'spose he said? He said he acted like that 'cause he wuzn't goin' to hev folks dis'p'inted in him. He said he ust to alwuz be gittin' dis'p'inted in people, they alwuz talked an' acted so sweet an' nice, an' then ud go an' do somethin' mean. When he wuz young he hed a sweet talkin' pardner who run off with his money, an' so it went all through his life. An' he jest made a solemn vow, he said, that he wuz goin' to show the wurst o' him right out at furst, then people wouldn't git dis'p'inted in him."

That was several years ago. Since then, thanks to Aunt Dilly, this peculiar man is now pretty well understood in his native village. Only last summer I attended a lyceum lecture there in which the speaker (talking on some subject of local importance) began his discourse with a fiery tirade against certain abuses, then with a genial smile he went on to say:

"And now, fellow citizens, having shown out my worst and most antagonistic qualities at the beginning, I will now, like our mutual friend Duffer, proceed to show myself in a more charitable attitude."

The thunder of applause that greeted this salient remark, attested to a pleasant appreciation of the character of "our mutual friend Duffer."

Money Making for Boys.

VELMA CALDWELL MELVILLE.

If I were a farmer boy, I should either cultivate some particular fruit or vegetable, go into the poultry business on the shares, or form a partnership with my mother in the preparation of fruit and vegetables for market. I would work hard, deal honorably, and prefer that no especial favor be shown me. I would be more independent to know that what I had, I had earned; and I am sure that later in life I would have cause to rejoice in those early days of business training.

The boy on the farm can usually have a piece of ground, rent free, on which to try his skill. He can set out a strawberry bed, borrowing the money for the plants—if need be—of his father, and giving his note in a business-like way. Off of this he cannot hope to make anything the first year—there may be a few berries for table use—but the second there will be returns, and so on.

The most prominent small fruit grower in Wisconsin says: "I can raise ten bushels of ripe, luscious berries with no more labor than the farmer puts on ten bushels of wheat. The wheat sells for 70 or 80 cents per bushel, my strawberries for $3 per bushel. The average cost per box of my berries, is two cents; I never sell them for less than ten."

THE ARRANGEMENT OF THE ALPHABET
(Drawn by W. T. Kemp.)

Now, if I were a farmer boy, I would deliberately settle, in my own mind, what business I wanted to engage in, remembering that there are losses as well as gains in everything. I would read upon the culture and marketableness of different fruits, of celery, of asparagus, of many different things, and then try to choose intelligently. I have a theory (based upon the experience of successful men) that most people do best by making a specialty of some one thing.

Some of our boys may think they have not time to run a little industry of their own, but in the case of the majority, "where there's a will there's a way."

Names of American States.

Alabama is a soft, musical Indian word, meaning, "Here we rest," and is said to have been the exclamation of a Redskin chief, who, wandering through that section, was captivated by its well-stocked hunting grounds, and decided there to remain.

Both North and South Carolina were so called as a compliment to Carolus II. (Charles II. of England), who bestowed a grant of that whole country upon eight needy courtiers.

OUR LITTLE FOLKS.

The Children Couldn't Agree.

Rap—rap—rap.

"Why, how do you do, Mrs. King! Walk right in. How is your little baby to-day?"

Mrs. King's baby was a tiny pug dressed in doll's clothes, and his bright eyes looked very much as though he would rather frisk about on his feet than to be lying back in his play-mother's arms.

"Well, Mrs. Ray, he is very poorly. He has just had the measles, which makes him very weak. Besides, his eyes are so bad he can hardly see out of them. But how is your baby, Mrs. Ray?"

"O," said Mrs. Ray, "she is just getting over the consumption, which makes her have the headache all the time. She is lying in the crib. Won't you walk in and see her?"

Now Mrs. Ray's baby was a tiny kitten, also dressed up in doll's clothes. She was lying back just beautifully, with her little feet sticking up in the air under her pretty red dress.

Mrs. King's baby suddenly said "Bow-wow!" Then Mrs. Ray's baby jumped right up out of the crib, and Mrs. King's baby jumped right out of his mother's arms. Then the two children stood and looked at each other, and they did look so funny all dressed up in little lace bonnets and pretty dresses and sashes.

"O dear," cried Mrs. King, "they are going to fight!"

Then Mrs. Ray began to cry and say, "O, what shall we do?"

Just at that time Mrs. Ray's brother Tom entered the room. He looked at the scene before him for just one moment, then he sat down and laughed, and laughed, and laughed.

"Tom!" cried his mother, running in, "what in the world is the matter with you!"

Then Tom rolled right over on the floor and laughed harder than ever.

"O, mamma," said Mrs. Ray, wiping away her tears, "won't you please stop our children quarreling? I'm so 'fraid to go near them."

So mamma took up the kitty baby and shut her up in the next room. Then she called Tom away. The little mothers breathed a sigh of relief. "It's very sad, isn't it," said Mrs. Ray, "that our children can't agree?"

The Little Sharp-Shooters.

ROSE MARY THORNE.

One morning, as pale-faced Daisy opened her bright eye, she saw her friend Blue Violet standing near. Greatly surprised that Violet was still wearing her blue spring dress, she shouted, "Why do you not doff your pretty gown?—the sharp-shooters will use you for a target," Violet was beginning to tremble and drop her blue petals, when suddenly she thought, "Why should sharp-shooters come to this peaceful meadow?" And she cried, "Where are the sharp-shooters?"

Daisy laughed and said, "Open your eyes and see them down among your own green leaves."

But Violet looked confused, for she saw only small green buds.

"Those little buds look very innocent," said Daisy. "Shall I tell you a secret about them? They are not buds, but tiny closed blossoms that will never open. When their seeds have grown and ripened, the little seed-carriers will suddenly burst and scatter the seeds in all directions."

"O," said Violet, "are those the sharp-shooters?" And she smiled at her own foolish fears.

Answers to the May Puzzles.

THE PARAGRAPH TRANSLATED.

The Vice President of the United States is elected at the same time and by the same process as the President. No man who is ineligible for the office of President can be elected Vice President. He goes into office with the President and their terms of office expire on the same day. In case the President resigns, or dies, or becomes unable to exercise the functions of the office, or is removed from it, the duties of his position shall be performed by the Vice President during the remainder of the term for which both were elected.

THE MAY PRIZE WINNERS.

1, W. Thomas Kemp, Maryland; 2, Henry J. Ritter, Pennsylvania; 3, Miss Ella C. Willis, Indiana; 4, J. F. Glosser, Pennsylvania; 5, William Bowen, Connecticut.

Mountain Farming in West Virginia.

Stopping one night in a little West Virginian town, my room was under the tin roof of a wing of the building. I awoke in the night and heard a heavy and continuous dripping on the roof, and next morning saw that the yard and road were soaked. I, of course, supposed that it had been raining, and was surprised to find that there had been nothing but a heavy mountain dew, and that the sound on the roof was but the dripping of the gathered dew from the higher roof of the main part of the building.

The people, naturally enough, do not often get away from their homes. I stopped for dinner one day in a secluded valley, at the home of a pleasant old couple who lived in a house which was very small, but which had an immense stone fireplace and a chimney which was really massive. I realized the perils of hill life quite vividly when the husband explained to me that his wife had been stunned and badly hurt a few days before by being kicked over a bank by a cow that she was milking. She was hardy and strong, however, and had already sufficiently recovered to be again about her usual work, and it was really surprising how, on short notice, she could offer us such apple and blackberry sauce, and apple butter, and rice, and coffee, all most tastefully cooked.

How to drain the farms is not one of the problems which puzzle the farmers of this region. They do not need to question whether tiling or ditching is the better, for they need neither. If, in fact, they could sometimes have less drainage than they have, they would be better satisfied, for when the floods come the crops in the valleys and on the hillsides are too often in danger of being washed completely away. It seems rather hard that, when the crops are not bountiful at the best, and are liable to be, at times, flooded away, they should, in addition, be liable to other dangers, such as beset richer and more profitable farms. But the red rust once in a while attacks the oats and causes serious damage, while, to guard against evils which fly, the farmers find it necessary to freely erect scarecrows. Gruesome enough, too, is one familiar type; the figure of a man, hanging from a swinging frame.

In a solitary home, in an isolated valley, I met an old man who, before marrying and settling down there, had, in one way and another, managed to reach all the principal countries of the world. He remembered, in particular, his visit to China, and still felt an aggrieved irritation when he recalled the fact that on the streets there he could scarcely be sure which were the men, and which the women. When, in the early part of the late war, there was considerable fighting and marching in West Virginia, it is said that some of the confederate soldiers from the more favored State farther south, grumblingly demanded to know what there was among those hills that was worth fighting for. But there was a good deal, even then, that was worth a struggle to possess. There is more now. In the near future there is bound to be a still greater increase.

ROBERT SHACKLETON, Monongala Co., W. Va.

The Parsees of India.

The Parsees of India, who form almost twenty per cent. of the whole population, are recognized as the most respectable and thriving Hindoos, being, for the most part, merchants and landed proprietors. Their general appearance is, to a certain degree, prepossessing. Many of their women are strikingly beautiful. As I neared Malabar hill I met many elegant turnouts filled with gaily-dressed children and richly-adorned women. No "purdah" veil obscured their handsome features, or their black, sparkling eyes from our gaze. These Parsees, originally from ancient Persia, continue faithful to the religion as reformed by Zoroaster. They are also called Atesh Perest, or fire-worshipers. Their traditions teach that the sacred fire which Zoroaster brought from Heaven has been kept continually burning, and the Bombay priests told us that their ancestors had brought some of it from Persia.

Parsees will not eat anything cooked by a person of another religion; they object to beef, pork, especially, to ham. Marriages can only be contracted with persons of their own caste and creed. Polygamy, except after nine years' of sterility, is forbidden. The Parsees stand alone in their treatment of the dead. At a certain stage of every funeral a dog is introduced to look at the corpse; and without this preliminary no spirit is presumed to rest in peace. But the dead are neither burned nor buried. The motive which deters alike from cremation and from sepulture is a fear of doing dishonor to the elements of fire and earth. Reaching the beautiful grounds, a typical Oriental park, encircling the Tower of Silence, I thought that, after all, the idea of being placed here after death would not be so very repulsive.

How pure and white the Dokhma or Tower appears; but let us approach nearer that we may examine more closely. But, no! we are waved back. Turning, we behold a procession of white-robed priests, the two in front carrying the corpse, a little child. Slowly they wend their way toward that once impressive, now forbidding, Dokhma. Reaching it, a coolie, perfectly nude, took the little lifeless form, jumped through the opening, and fastened it securely to one of the iron gratings within. But, hark! what is this whizzing noise? Look! hundreds of vultures surround the Tower. The child's body is scarcely adjusted before they swoop down upon it; fighting and screaming, they tear the tender flesh from the body. The bones are then exposed to the dew and the sun until the last vestige of flesh has disappeared, when the whitened bones fall through into a pit beneath, from which they will be removed to a subterranean cavern. I did not wonder that none of the family or friends attended the body to its final home. Leaving this spot I was driven to the seashore, thence to the city. On the way I saw many devout Parsees adoring the setting sun.

E. B. SIMMONS, Calcutta, India.

Fodder and Water for Range Stock.

The range cattle business as at present conducted ought to be abhorrent to a humane man. In Southern Arizona we have a dry summer every two or three years, and serious losses in cattle from starvation necessarily follow. Almost every spring, too, at the change from dry winter feed to watery spring grass, many old cows die off. Most of these might be saved, by all the large calves being weaned ere winter sets in, but many ranchmen give no attention whatever to that important matter. I see almost every day fine sleek calves eight to ten months old, whose skeleton-like mothers died during the winter. When we have only light summer rains, cattle must go six or more miles for feed. They stay out as long as possible, and then, driven by thirst, they hasten back, under a fierce sun, to the water troughs, where they drink so immoderately, that the weight of their load forces them to lie down near by. If the water is cold and they have been going on in the same way for weeks, many of them never get on their feet again. There is no attempt made to save the life of an animal once it is unable to rise. A kind hearted owner kills his prostrate stock at once, but out on the range there are scores, or it may be hundreds, which he will never see. It is known that a cow will live eight or ten days without food or water, after she is too weak to get up. Hay of some kind should be provided to carry the cattle through the worst storms of winter, and every ranchman who can possibly put up hay is doing so. The deadly winters of northern latitudes are worse from a humanely viewed standpoint than our summer disasters, but neither can be contemplated with any satisfaction.

In the Southwest we are not fortunate enough, except in a few favored localities, to command water for hay production, hence the only remedy seems to be under-stocking of the ranges.

JOHN DARE EMERSLEY, Cochise Co., Arizona.

A New Farm in South Dakota.

I wish to say a few words to the sons of farmers who are racking their brains trying to figure out their future, meditating removal to the already overcrowded cities, or looking for a chance to rent some worn-out farm, whereby they can make an honest living. To such I would say, by giving my own experience, that it was some time before I could make up my mind to throw off the shackles of slavery which man is heir to in a large city, or on a rented farm. My future outlook was gloomy, to say the least. This state of affairs gave me no rest, until one evening, having made up my mind during the day, I told my wife that in the morning I should start out for independence and a little free air; having packed my grip and taking what little cash I had laid up, I struck out for the West. A few days' ride landed me in Walworth County, South Dakota, in the spring of 1886, then only very thinly settled; I looked up a claim and filed upon it as a homestead, then with what money was left I sent for my family, bought some lumber and a small quantity of provisions. When my family arrived they were welcomed to our house, with no landlord to call, no boss to fear, and, although I had only five cents in cash, a 12 by 14 shanty and a homestead of 160 acres I felt nevertheless that the air was fairly ringing with freedom. It is true the first year we experienced the hardships and vicissitudes of a pioneer's life, being fresh from a great city, both my wife and I, and having only a reading knowledge of farming, gained by the AMERICAN AGRICULTURIST, we found that there was something more to be done than simply scattering seeds and waiting for big returns. Nevertheless, I have to-day 270 acres of grain, I expect not less than 20 bushels to the acre. The prospects for a crop have never been brighter.

H. R. DE MALIGNON, Walworth Co., S. D.

Nature's Own Beehive.

Perhaps the most interesting receptacle for honey, on the American continent, is in the Coast Range of California. During a series of explorations and surveys, made by the writer, covering a period of some ten months, in the mountains mentioned, many interesting points were visited. Among these were a famous rendezvous of the notorious bandit "Joaquin" Murietta, and the last battle ground of that highwayman and his followers, where, in a desperate fight, the little squad of Captain Love succeeded in capturing the scourge of the West. But, from the view of a naturalist, none could be more interesting than "Bee Rock." On a little tributary of the Arroyo Alcalde, the rock rises 120 feet perpendicular from the bed of the creek, the back of the mammoth piece of granite extending into the adjacent hill. There are several large crevices, whose depths no man knows, and the recesses of these have furnished homes and storehouses to many swarms of the busy workers. How extensive these deposits are, it is impossible to say, as the larger part is, evidently, beyond reach of investigation. There is, however, considerable honey in sight, and each year bee-hunters succeed in getting hundreds of pounds. As access may be had only from the face of the cliff, the mode of procedure is similar to that pursued in securing birds' eggs in some places, by being suspended from above. Owing to the rather vigorous resentment of the bees, the operation is anything but desirable. There have been instances where, after these partial robberies, the honey might be seen tracing its way down the side of the declivity, and mingling its sweetness with the waters below.

CYRIL MARR, Fresno Co., Cal.

The Everglades of Florida.

Near lake Kissimmee are immense tracts of reclaimed lands where, previous to the drainage operations, from three to six feet of water covered the country. No healthier place can be found than right among the dredging operations along the lakes and canals. The employes are nearly all white, and their strong and healthy appearance corroborates the statement that sickness is unknown among them. Stock-raising, which is carried on to a limited extent, is capable of becoming a great industry upon these lands, and so is vegetable growing. The agricultural possibilities are almost without limit, and the reclaimed lands will become a great source of supply for winter vegetables. The people are especially sanguine over the prospects for three great agricultural products, sugar, rice and cassava. The first two are already a success. Cassava is one of the most profitable crops which can be grown on the drained lands. Experiments at the station show that it can easily be made to yield from five to ten tons of roots to the acre, and these contain from 20 to 25 per cent. of starch. This section with proper development can supply the entire American market with glucose, which now is principally

supplied from Buffalo, N. Y., and Peoria, Ills., and this is an immensely profitable industry. Inquiries among working people lead to the conclusion that while there is plenty of work to be had the prices for labor are low. In the vicinity of Kissimmee laborers get $25 per month and found. Garden and truck farming are most profitable occupations. The climate is considered very healthy. What Florida needs to-day is an immigration from the older States of young men of means and industry, who have ability to plan a small business upon which they can enter on their own account, and courage to undertake it. To such classes the State affords as good an opening as there is in the United States, not only to make an easy living, but to secure a competency.

EDWIN M. TRUELL, Lee Co., Fla.

The Sugar Harvest in France.

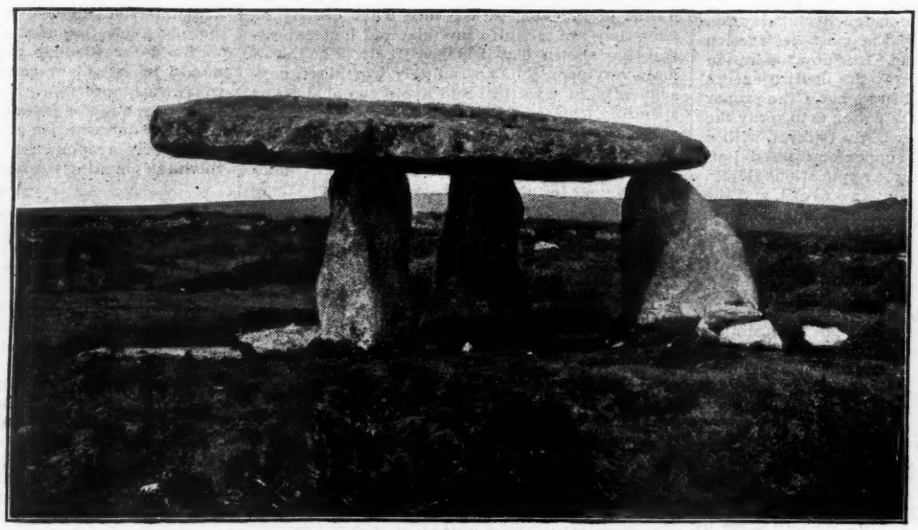
American maple-sugar making takes place in early spring, but beet-sugar making in France renders the autumn a busy season. By constant practice, sugar experts are able to judge very nearly when the beet is ripe, but most farmers send sample beets to a chemist, who, for a small fee, analyzes the roots, and when he receives the sample containing the greatest amount of sugar, he notifies the farmer, who has the beets turned out with spades, and left exposed to the air until dry. The tops are then cut off, and the roots carefully piled in the field and covered with leaves and earth to protect them from the sun and frost. From the time the beet is dug out of the ground until it is ready for washing in the factory, it is moved with the greatest care, as even the slightest scratch or bruise lessens the sugar and therefore the price. The roots are carted direct to the sugar factory, but in many cases they have to be taken to the railway station and shipped in cars many miles. During the summer, agents visit the farmers, and contract for the crop, just as the wool and wheat of American farmers are bargained for beforehand. Either a very warm summer or a rainy autumn diminishes the sugar harvest. The varieties of beets grown are the Long Red, the Short Red, and the Castelmandary. The pulp from which the juice has been extracted at the factory, is kept in pits, and fed to the stock. The caked residue of refuse refined from the sap is spread over the fields as a fertilizer. For keeping the beets till winter or spring for factory use, or for feeding to stock, a trench is dug four feet wide, four feet deep and as long as is needed. In this pit the beets are carefully piled, and covered with soil or sand, and three feet of straw put over all. As the weather grows colder, this is again covered with a layer of earth. The sugar beet is one of the money crops of the thrifty peasantry of France.

A. LECAM, Finisterre, France.

The Cromlechs of Cornwall.

One of the most remarkable features of Cornwall and some other parts of Great Britain is the number of peculiar stones—called "cromlechs"—which are to be found scattered throughout the country. These cromlechs are large flat stones (as shown in the illustration) lying flat upon other stones placed in a vertical position. The origin of the name and the object of the cromlech is still a subject of discussion among antiquarians. It is said by some critics that the word means "the stone of Crom," who was one of the gods of the ancient Irish; while others contend that it means "crooked stone." Not a few experts hold that these monuments were graves of celebrated men in their day; but the majority of archæologists believe that they were Druidical altars. These cromlechs are called "quoits" in Cornwall, because it is a popular idea that they were once the "playing stones" of giants. The one shown in the illustration was the largest in Cornwall up to the year 1815, when it got displaced. It is situated at a village called Lanyon, near Penzance. The large covering stone, which is 47 feet in circumference, was raised on three unhewn pillars of granite to such a height that a man on horseback could easily ride under it.

F. C. CHAPPELL, Cornwall, England.



THE LANYON CROMLECH OF CORNWALL.

Dairying in New Brunswick.

The Province of New Brunswick is well adapted for dairying, although our people have been rather slow to realize the fact. The climate is good. The heat during the summer is never intense, like it is in other places in Canada, the nights are generally quite cool, which greatly facilitates the dairyman's work. Our growing season is one of the best in the world, as vegetation is very rapid, and cattle can always find an abundance to eat and drink. Until a few years ago dairying was carried on a very small scale. The butter and cheese that was brought into market was of a very inferior quality, and was all of domestic manufacture; and for many years this province did not manufacture enough dairy produce for her own consumption but had to import from the sister provinces. There is always a market to be found for all dairy produce, and this branch of agriculture, when it receives careful attention, yields good returns. The Provincial government has dedicated $10,000 to the cause, while the Dominion government has established a number of dairying stations and traveling dairies.

Our cheese is second in quality to none in the world, and it will thus be seen that from this time forward there will always be a demand for New Brunswick dairy produce, where a few years ago the province of Ontario occupied the foremost position in this line. In 1891 five cheese factories were built and successfully operated in this province. The output that year averaged about 15 tons per factory or an aggregate of 75,000 pounds. In 1892 there were eight cheese factories in operation in Carleton county and four in Kings county, while at Kingsclear, in York county, a creamery was run as a government experiment station through the summer, while last winter the government has operated the creamery at Sussex, N. B. The creamery at Kingsclear, however, has not shut down, but is being operated by the company.

There are now 16 cheese factories and three creameries in this Province, with the prospect of eight or ten cheese factories and two or three creameries being erected this year. Heretofore the majority of our farmers made no attempt to keep superior breeds of cows. They took very little pride or interest in their cows, save to milk them, and that was never a very heavy job as the cattle never gave much milk. But since they have been induced to look into this very important subject, and to thoroughly consider all the benefits that must accrue from careful attention and a systematic handling of the whole machinery, they are endeavoring to raise into thoroughbreds, and the old scrubs are disappearing. The possibilities which the dairy has within its reach, in this Province, but few of its inhabitants clearly realize.

ALF. H. MCCRADY, St. Johns, N. B.

Rocky Mountain Wild Flowers.

The Rocky Mountain region is preëminently qualified for the production of almost innumerable wild flowers, many of which are worthy of cultivation. Although we have here a flora distinctly our own, many natives of the East have adopted our sunny slopes, shaded cañons and mossy ravines for their homes, and far surpass their Eastern sisters in beauty and size. These, to one coming from the East, seem like old friends, and cheer many a lonely hour for the settlers who are, perhaps, longing for just such a glimpse of homelike things. But we must admit that our Eastern wild flowers are far less beautiful than the natives of these arid plains and sandy hillsides. It seems wonderful that this can be so, with the lack of moisture and driving sandstorms here. Early in the summer the hills are covered with the most brilliant colors, and with varieties which baffle many a learned botanist. Often in high altitudes, above the pines, outlined against the sky, almost in the regions of perpetual snow, are found fragile flowers of the most delicate hue. In quiet cañons, where reigns an eternal silence, unbroken, save by the soft footfall of some prowling animal, wild roses festoon the gloomy walls and hang over frowning chasms. Not all of these dainty beauties would thrive under cultivation, but a few here and there would richly repay the flower lover for the difficulties attending their culture. Almost with the first breath of spring there comes to light a dainty little yellow Fritillaria. To children, this flower, which they call "buttercup," is the first sure harbinger of spring, and they never weary of its pretty face, but mourn when the last golden bell has faded. Many pretty tales are told by them of the soft chiming music heard from these flowers when belated travelers chance upon fairy carnivals. For the sunny-hearted children people even our sagebrush wastes with those tiny creatures. A little later in the season come the *Viola Beckwithii*, often called "Johnny-jump-ups" by their warm admirers, the children. They are among the sweetest of violets grown, and thrive well under cultivation. *Corydalis aurea* is found in low, shady places. Along rivers and in partially shaded ravines, this plant grows in its greatest abundance. It is especially desirable on account of the beauty of its foliage, as well as that of its flowers.

Many other wild flowers might become, under the careful hands of a florist, treasures indeed; but with regret we see some of our choicest kinds growing less and less common; as if, with the growing population, they shrink away. Many hillsides that once were red with the peculiar Indian flower see it no more. Many ravines that once were robed in tints brighter than the rainbow have, after the building of roads and unceasing din of the stone quarry, become as somber as an Eastern hillside, even in places where no foot has ever reached their beds. These beautiful wild flowers are fast disappearing before the destructive hand of man. Soon they will forsake their native haunts and be lost to us forever, unless, by placing them under cultivation, they are secured for the future in all their marvelous loveliness.

ELISABETH PHELPS FARNHAM, Weber Co., Utah.

The Finest Farm Paper.—I am more and more pleased with the AMERICAN AGRICULTURIST. It is the finest farm paper I have ever seen.

M. S. SKIFF, Marion Co., Oregon.

Dwarf Pear Trees.—C. E. Coffin, Pontotoc Co., Miss.: Some twenty to thirty years ago what are called "dwarf pear trees," or trees worked on the quince stock, were exceedingly popular, and hundreds of thousands of such trees were annually sold by nurserymen and importers of plants, but of late, the demand for such trees has become quite limited, as they are rarely planted except in gardens, standard trees being far preferable for orchards. We do not know from what source you obtained the information that the Lawrence pear succeeds only as a dwarf, but it is certainly an error, for this variety has been extensively cultivated as a standard, or grafted on pear stocks. We are not surprised, however, at its failure when grafted on the LeConte, because of the great difference in the growth of the wood of the two varieties, or we may say species, because the LeConte is really a Chinese production, and very distinct from European pears. Dwarf pears, of all varieties, are pretty and useful trees for small gardens, but elsewhere they are rapidly losing their former prestige.

Pear Blight.—Mr. J. E. Houston, St. Landry Co., La.: Pear blight is one of the most destructive fungus diseases of the pear. It is now too late in the season to effectually stay the disease except by cutting off the affected branches. The proper method of combating this affection is to spray the trees so soon as the leaves begin to form, with a solution of carbonate of copper or diluted Bordeaux mixture. Two or three applications should be made at intervals of about two weeks, and the spraying stopped before the fruit is half grown.

Soft Maples, Orchard Grass.—Samuel McLean, S. Westmoreland Co., Pa.: 1. The soft or swamp maple, usually grows in low, wet grounds, while the hard or sugar maples, is found mainly on high lands. Neither makes "two growths" in ordinary seasons; consequently, this cannot be taken as a specific characteristic of the soft maple. It is only the sap of the hard or sugar maple that is utilized for making sugar. If you want to set out a sugar orchard, there will be no difficulty in finding all the plants you need in the forests in your neighborhood. The seed of the soft maple ripen in spring, or early in June, while those of the sugar maple mature late in fall. 2. We do not think you will make a success of sowing orchard grass in woodlands where the surface is covered with leaves. If you do not care to burn the leaves, better wait until they have decayed, then harrow and scratch up the fresh soil before sowing the seed; in the meantime cut down all sprouts, brush, and briars, as they appear, or use the new woodlands for pasture until all the wild growth has been practically destroyed.

General Purpose Fowl.—B. D. Hill, Ontario, Canada: For a general purpose fowl for your latitude the Argonaut would probably prove a desirable acquisition. It is an excellent layer, has good table qualities, and is of an admirable size for general use, not far different from that of the Plymouth Rock. In plumage it is moderately short feathered, of a handsome buff color, and is attractive in appearance. Its low pea comb and its clean, bright yellow legs add to its useful and attractive qualities. The Plymouth Rock and the Light Brahma are also well suited to your needs, for they are hardy fowls, and possess a union of laying and eating qualities that make them popular with the many who keep a few hens.

High Priced Eggs.—S. T. Lee, Essex Co., Mass., writes: "I notice in the papers advertisements of poultrymen who offer eggs for sale at prices varying from one to ten dollars per dozen. Are not these prices outrageous? Was there ever a dozen eggs that were worth five dollars, let alone ten?" That depends. If one wished the eggs to eat, a dozen eggs at five dollars would prove pretty expensive eating, but to set is quite a different matter. When one buys eggs for hatching, he is not buying simply eggs, but chickens in a very convenient form for shipment. If the chickens raised from the eggs will bring enough to cover the first cost of the eggs, the expense of rearing, and pay for the time and trouble used about them, then they are worth five or more dollars per dozen. A few years ago a breeder of our acquaintance had a pen of Indian Games. He sold the eggs at six dollars per dozen. To one gentleman he sold four dozen eggs, and from these eggs the buyer reared a fine lot of chickens. Ten dollars each would not buy them, and for one of the chickens, a male, he three times refused the sum of $50. In this case, the eggs were worth much more than six dollars a dozen. Five or ten dollars for a dozen eggs is to be considered on the same basis as the large sums paid for thoroughbred horses, cattle, sheep and swine. A thing is worth what it will bring, and as eggs for hatching do bring five to ten dollars per dozen, and as buyers find it profitable to purchase, even at such prices, it is but fair to conclude that the prices breeders of poultry get for their eggs are not outrageous or unreasonable.

Grafted Fruit Trees.—Will H. Hopps, Kane Co., Ill.: By budding and grafting trees we are enabled to rapidly multiply and perpetuate varieties which time and experience have determined are worthy of preserving and cultivation. Out of many millions of seedlings raised in times past, a few hundred have been selected for perpetuation, and this is mainly done by budding and grafting upon seedling, or other inferior kind of stocks. If you plant seedling apples and cherries, you have no means of knowing in advance what quality of fruit they are going to produce, and long experience has shown that it is very likely to be in the main very poor, if not absolutely worthless; consequently, to save time and avoid the chances of spending time and labor in cultivating inferior varieties, we plant grafted trees of known merit and value. Besides this risk of securing few or none of value from seed, we must wait many years longer for seedling trees to reach a bearing age than with grafted trees. Planting seedling trees would be very much like going back to the old stagecoach for traveling about the country.

Hedge Plant Wanted.—W. C. Fowler, Regina, N. W. T., wants to know "what is the best and quickest growing hedge plant for a cold climate like that of the Canadian Northwest." We presume you refer to some thorny plant that will, in a measure, turn cattle, although you do not say for what purpose the proposed hedge is intended. We know of but one such plant that would be at all likely to thrive in a very cold climate, and that is the Buffalo berry (*Shepherdia argentea*), and this is only slightly thorny, but it grows very dense and stocky, besides bearing an excellent edible berry. As this Buffalo berry is an indigenous shrub, or small tree, growing in considerable abundance as far north as Alaska, we do not hesitate to recommend it as an excellent hedge plant for cold climates. As it is not at all difficult to transplant, when of considerable size, you may be able to procure the plants near at home, and secure a good hedge in less time than would be required to raise one from seed.

Building Log Houses.—W. Gibb, Ward Co., N. Dak.: Log houses are usually such rough and primitive structures that almost any country carpenter can put one together without much trouble. If the logs are hewn square, then the building would come under the name of block house, which is, of course, a great improvement upon one built of round logs, chinked with triangular pieces of wood, and filled in with clay, or mortar. A good block house is a building not to be despised anywhere, and especially in a new country. Cottonwood will answer very well for the sides of the house, and for floors, but it is rather too soft for shingles, and decays rapidly when exposed to the weather in a moist climate. The same is true with cottonwood fence posts and rails, although they will last a number of years in some of the dry regions of the far West.

Holding a Steady Rein.—C. L. Baker, Washington Co., N. Y.: While driving, the reins should not hang so slack that it is difficult for a horse to know which way the driver intended he should travel. The animal, however, soon finds out if he attempts to turn the wrong corner, or runs the wagon wheel into a mud hole, or strikes a stone in the road, as that act seems to jog the driver's memory, for the horse is given a vicious jerk, supplemented by an uncomplimentary remark from the driver, when he alone is to blame for carelessness and inattention. A steady pull on the reins supports the horse, and allows him to travel easier. In a great measure it prevents stumbling, and should an accident happen to the vehicle, or should the horse become frightened, he can usually be brought under control in time to prevent any serious mishap. In the field, this matter is not quite so important, unless you have a young team, full of mettle and vim.

Crossing Light Brahmas.—S. C., Lynn, Mass., has a flock of Light Brahma hens, and wishes to know what male bird will be the most useful to cross upon them for the production of fine poultry for market. There is nothing better than the Indian Game. It adds an abundance of meat to the breast, and the chickens from this cross, when killed and dressed, make very handsome poultry. This is really one of the best crosses for market purposes with which we are acquainted, and can unhesitatingly be recommended.

Sowing Pure Seed.—J. Mittig, Cass Co., Mo.: It takes as long to prepare the soil and sow poor, foul seed, as it does to sow the best seed obtainable. The former will give poor results, injuring the land for years to come with weeds and foul stuff that actually reduces the value of the land. If you should desire to sell, the land will be worth from three to ten dollars less per acre, besides often rendering the produce of the farm unfit for realizing the highest market prices. Should there be a question that any grain or grass seed obtained for seeding purposes is not pure, it should be resold or carefully recleaned under your own supervision. It takes but a little while to do this, and the future saving in time, annoyance and depreciation of contaminated land will abundantly recompense for all the trouble involved in cleaning the seed.

Grading About the House.—L. Root, Trumbull Co., Ohio: Grading up the house yard is especially important when a cellar is under the building, or the foundation is laid in mortar. No matter if the building is well provided with eaves troughs, a dashing rain will cause barrels of water to fall at the side of the building, and, unless properly graded, a great portion of it soaks into the earth, and ultimately into the cellar, or beneath the building, causing not only dampness, but crumbling the mortar, and allowing the walls to bulge and settle unevenly. Very much of this trouble can be avoided by making the grade of the soil about eight inches for the first five feet from the building. Not only this, but a strip about two feet wide all around the building should be made firm and solid by pounding with a heavy maul or sledge when the soil is moist.

Transplanting Wild Flowers.—J. Thomson, Brown Co., Ill., desires information as to how he can transplant successfully some of the beautiful woodland wild flowers. It is not always possible to make the plants thrive, and give as good results in their new home. Especially is this true of those which grow in deeply shaded woodland, or along streams, or among the moss-grown rocks. In each case you should endeavor to make the conditions of moisture, shade, temperature and soil, as near like the place from which they are transplanted as possible. In this way you will not be very sadly disappointed in the results obtained. Transplant only in the autumn, or very early spring, and not when the plants are in full bloom. Hence it is best to mark in some manner the location of the plant desired. Late in the season there is, in many species, but little to indicate their whereabouts, especially in those with bulbs and tubers.

Borrowing and Lending.—H. Shaltz, Sangamon Co., Ill.: There are but very few people who would not willingly accommodate a neighbor by occasionally lending him a tool or other needed article. There is a limit to good nature, however, even in these supposed acts of kindness, especially when the borrower is persistent, or fails to return the article promptly, or as agreed, or returns it in bad condition, or appears unconcerned or ungrateful for the favors granted. There is no question but that occasional borrowing and lending is a kind, neighborly act, and strengthens the bond of friendship between the parties interested, especially if the article is returned promptly and in

good condition, or, in case of articles like grain, sugar and flour, an equally as good brand and full quantity is returned in exchange. However, from the inconsiderate, persistent borrower we all wish to be delivered. The old maxim, "A friend in need is a friend indeed," is a good and true one, but when the need is a daily or weekly one, without a corresponding recompense or appreciation, then charity ceases to be a virtue.

The Brighton Grape.—L. Miller, Atlantic Co., N. J.: This handsome red grape is of superior quality and flavor, which is peculiar to this variety, but very agreeable to those who like it or have learned to like it. It should not be planted on low, wet, nor sandy land, for it mildews badly, and is inclined to make a large growth of wood at the expense of productiveness. It is not readily self-fertile, either. When planted with other varities and on a clay soil, or one where it will not grow too much wood, it bears well and abundantly.

Mulching Does Not Retard Blossoming.—D. C. Powers, Tompkins Co., N. Y.: It is commonly supposed that a heavy mulch of manure or other material around berry bushes and trees, to prevent the ground from warming up so rapidly, will retard blossoming in the spring, and be a help in escaping late frosts, but the experience of careful experimenters shows this to be a fallacy. The temperature in which the branches and buds are placed seems to influence the blossoming more than the temperature of the ground in which the roots grow. A mulch a foot thick around berry bushes did not, apparently, retard their blossoming in the least. It seems, therefore, that the recommendation to apply coarse manure around peach trees late in the winter, when the ground is covered with snow, in the hope of keeping the frost in longer and holding back the blossoming period, to escape frosts, is unprofitable, and some other means must be discovered to accomplish this much-desired result.

The Best Mutton Sheep.—C. E. Carpenter, King Co., Wash.: A very popular mutton sheep here, and in other countries where mutton is appreciated as it deserves, is the Shropshire. This sheep has the tender, juicy, high-flavored meat of the Southdown, with its hardiness, and all its other good qualities; a larger size and heavier fleece, and it produces twins more frequently. It makes more proportionate growth for the same amount of food, and is thus a more profitable sheep.

The Cornell Mixture.—L. C. Price, Cook Co., Ill.: A mixture useful as an insecticide and fungicide, and comparatively harmless to trees and plants, has been compounded by M. V. Slingerland, assistant entomologist, of the Cornell experiment station. It is merely the Bordeaux mixture, kerosene emulsion and Paris green, mixed together. A good mixture is formed, which does not separate for some time. Mr. Slingerland has been experimenting during the summer with this mixture, to find its efficiency, and the proper proportion of each to use. It appears to be a valuable discovery in that it will save much time in applying, and is good for insects and fungi as well.

Green Moss on Flower Pots.—R. Riker, Ulster Co., N. Y.: The green moss which forms on the outside of plant pots is not injurious to the plants growing in them. In conservatories kept for show and pleasure, much time is spent in washing pots, which could be used to better advantage. Experiments at the Cornell experiment station, last winter, showed that the growth of this moss could be nearly or entirely prevented by soaking the empty pots in Bordeaux mixture, or the ammoniacal solution of copper carbonate. The latter gave better results, for after several months the pots soaked in this had no moss, those treated with the Bordeaux mixture had a little, and pots not treated were well covered.

Cherry Aphis.—L. G. C., Union Co., N. J.: The myriads of small blackish flies on the cherry twigs and leaves you send are the common black aphis of the garden cherry. These pests of the cultivated cherry are exceedingly numerous the present season, and it is rare to find a tree wholly exempt from them anywhere, although on some they are not as numerous as on the specimens you send. Spraying the trees with kerosene emulsion will kill all the insects with which it comes in contact, but, unfortunately, when rolled within a leaf it is impossible to reach these pests, and while a few millions may be destroyed, other millions will escape. The proper way to deal with these insects is to spray the trees just as the buds are swelling and before the leaves unfold in spring, for if their eggs are destroyed at this time no brood of the pests would follow. When the hot, dry weather comes on the aphis depart and a new growth of twigs usually follows, but is seldom as vigorous as the first, besides the aphis prevent the maturing of the fruit. But spraying with kerosene emulsion, or strong tobacco water, will be useful at almost any time in checking the increase of this great pest.

Wind-Breaks.—D. Webb, Worcester Co., Mass., writes us: "A few years ago I set out a short hedge of our Northern evergreen trees, firs, hemlocks and spruces, which made an excellent growth in this form, the only trouble with them being that they were placed too near together, so that after a few years the lower branches died, to some extent, though the hedge still does excellent service as a wind-break for one side of the house. The work is easily done. Let the trees be transplanted when three or four feet high, disturbing as few of the roots as possible, and allowing as much earth as possible to cling to them. Provide abundant water for a week or two, and very few should die. If a wind-break, pure and simple, is desired, two or more lines of these trees can be set a few feet distant from each other. Such wind-breaks will be found very serviceable in keeping houses and farm buildings warm during the winter, and the spring is the best time of the year, on some accounts, in which to set the trees.

Breeding Calves Which Drink.—Henry Stewart, Macon Co., N. C., writes us: It is an encouragement to every owner of animals to improve them in every way, to know that every step taken in the training of them may become hereditary. For several years my calves have been trained by weaning them at birth and not permitting them to suck the cow, and the cows and calves both now come naturally into the habit. The cow does not fret for the calf, and the calf drinks milk like an old and experienced animal. The last calf, one born in March of this year, and out of a cow reared in this way, and for three generations back, at first touch of the warm, fresh milk to its nose, drank it readily, and to the last drop, without any fussing, and as well as any weaned calf. This mode of weaning calves is an easy one, and it is a specific preventive, as I believe, against that deadly nervous disorder, milk fever, for the cow is entirely freed from all excitement about the calf.

Florida Phosphate.—Florida: The so-called phosphate is really phosphate of lime, and one of the most useful and indispensable fertilizers. It is used in enormous quantities for the manufacture of superphosphate of lime, and when finely ground is used in its natural condition as a fertilizer for all kinds of crops. It is found all the way from North Carolina to Florida, in large deposits on, or a few feet below, the surface of the ground, where it has accumulated in ages past by the decomposition of myriads of marine animals whose bones have gathered in the shallow waters they inhabited, and where they lived and died during, we know not how many centuries. These remains are dug up and washed free from sand or gravel, and are then ready for use. It is now worth about $12 a ton.

Early Breeding Ewes.—Charlottesville, Va.: To bring ewes into season for having lambs in December, it is usual to keep only two-year old sheep which have had no lamb. Then by feeding them well and turning in the ram (an old one is preferable) the ewes may be bred in June. Or, the ewes older than this may be kept over one season and not paired until the next summer, in time to have lambs in October or November. But it will be more satisfactory to begin with young virgin ewes.

Employing Sufficient Help.—J. Sears, Orange Co., N. Y.: Be careful to secure plenty of hands for the threshing. If a farmer desires to obtain a reputation for meanness, coupled with stinginess, let him attempt to thresh his grain, saw wood by steam or other power without sufficient help, for at least two seasons in succession. There are but few things that will roil and disgust the average man quicker than to be compelled to do almost two men's work, simply because his employer desires to save the expense of an additional man. Threshing by steam power is very hard on the men, and in nearly every neighborhood there are usually one or more farmers who always attempt to thresh when short of help, and in these cases the day men do not care to aid them, nor the neighbors to exchange work with such parsimonious ones. Often the strain of tugging to keep the machine running will tell on the workmen for weeks thereafter, with no thanks or extra compensation from the employer.

Blooded Stock.—W. Gouch, Blaine Co., Oklahoma: There is no question but that the person who first introduces blooded stock into any old, settled farming community is a public benefactor. The introducers reap a financial benefit therefrom, provided they manage the work on a strictly business basis. The public know that they have such stock, and if a male, that the services may be obtained at not too high a charge. The charges for a ram may be $1; for bull about $5, and for stallion from $15 to $30, or, in most cases, just about twice the ruling terms for common stock, remembering that pure bloods and a reliable pedigree have much to do with the business. With sheep, swine and cattle it is best to obtain one of each sex. This will not only enable you to increase your stock of pure bloods, but gives others an opportunity to see them. Usually, by corresponding with several breeders of the stock you wish to obtain, better terms can be obtained than by only consulting one breeder. At least you will be better posted regarding the prices, and if you are able to examine the stock before purchasing, so much the better for you and the seller, as then no cause for dissatisfaction should result.

Plum Curculio.—A. H. Ferris, Lincoln Co., Neb.: The common plum curculio, does not confine itself to the plum, but attacks and breeds in the cultivated varieties of the cherry, peach, apricot, nectarine, and in the wild plums, and in almost all kinds of stone fruits. If none of these are prevented, it will attack the thorn apples, also crab apples. In fact, it finds some kind of fruit in which to perpetuate its species; consequently cutting down all your plum trees would not result in the starving out of this pest. Insect life rarely hangs upon so slight a thread as one kind of food, or source of supply, and while it is true that insects have a preference in such matters, they can usually change their food, as well as habits, if it becomes necessary to prolong their lives.

Black Sand Spots.—J. E. Lay, Lavaca Co., Tex.: The black sand and shell spots on your farm probably contain some chemical or mineral substance in excess, and this is the cause of the burning and failure of the plants growing therein. Just what the noxious elements are cannot, of course, be determined, except by a careful examination or analysis, but we would suggest digging these spots over deeply and adding barnyard manure or some other form of carbonaceous materials. You have an excellent opportunity of making experiments and determining the cause of the failure of plants on these half barren spots. Wash some of the soil, and then test the insoluble parts for iron, and other metals, or alkali, which may be present in excess. As you are a druggist by profession, you will probably know just how to proceed in making such tests.

Boarding the Strawberry Bed.—P. W. Hunt, Shelby Co., Iowa: Mulching or covering strawberry beds with boards, and boring large holes in which to insert the plants, might prove a good system, but at the same time, a rather expensive one, as there are 43,560 square feet in an acre, and it would require just this number of feet of boards to cover it. The boards might keep the weeds down and the soil moist underneath, but we very much doubt if the entire crop of berries would pay the cost of the boards and placing them in position. We have known slabs from a near-by sawmill being used for mulching, in the way proposed for boards, only notches were cut every two feet along the edges for the plants, instead of boring large holes for them, but even where the slabs cost nothing except the hauling and putting them in position, the results were not such as to encourage the cultivation to extend or continue the use of slabs as a mulching material. Good bog or other coarse hay is usually cheaper, and answers an equally good purpose for mulching.

SCIENCE IN FARMING.

Size of Seed Potatoes.—That small pieces of seed potatoes are unable to overcome unfavorable conditions, is the conclusion reached by P. M. Harwood and P. G. Holden, from experiments at the Michigan and twelve other stations. The potato growers of Michigan (B. 93) do not seem to plant enough seed. For the usual distances, the half potato gives better results than any smaller amount, and for weak growing, or small-tubered varieties, even a larger amount of seed will be found more profitable. The increase in seed within ordinary limits produces a marked increase, both in total yield and in marketable crop. An increase in seed from one eye up to the half potato produces an increase in the net value of the crop. The increased yield from the whole potato over the half potato is not sufficient to cover the cost of the greater quantity of seed. For total yield of large and small potatoes, 76 out of 95 experiments were in favor of the half potato, and 19 in favor of two-eye pieces. For marketable yield, 58 out of the 73 experiments were in favor of the half potato, and 15 in favor of two-eye pieces. For net marketable yield, 23 out of 30 trials were in favor of the half potato, and eight in favor of two eyes. But for net value of crops, 22 out of 30 experiments were in favor of the half potato, and eight in favor of two eyes. A comparison of the whole potato with the half potato shows that, for the total yield, 46 out of 54 trials favored the whole potato, and eight the half tuber. For the marketable yield, 36 of the 42 trials favored the whole tuber, and six the half. For net marketable yield above seed, seven of the 13 experiments were in favor of the whole potato, and six of the half. But, for the net value of the crop, seven of the twelve experiments were in favor of the whole tuber, and five were in favor of the half potato for seed.

Common Salt as a Fertilizer.—The question of the value of common salt (chloride of sodium) as a manure is often discussed by practical farmers, and it is claimed that plants are frequently benefited by its application. The beneficial action of the common salt contained in seaweed manure is attributed by H. J. Wheeler and B. L. Hartwell, of the Rhode Island station (B. 21), to the fact that sodium is a natural constituent of all farm plants; and some soils, so far inland that they get but little of it in the rain water, or in which it is naturally deficient, may contain such small quantities that its application supplies the crop with a direct fertilizer which is lacking. Farms upon which large quantities of commercial fertilizers are used will generally receive therewith sufficient soda. Salt may be serviceable in killing fungi, and in freeing land from larvæ of insects. It acts as a solvent upon other elements in the soil, setting them free for the use of the crop. It absorbs moisture, and may, therefore, be of some use in a dry season.

Lathyrus Silvestris.—The Flat pea is a valuable forage plant, and, as in all the vetches, there is more digestible protein and fat than in the case of oat hay. E. J. Wickson, at the California station, finds (B. 100) that the nutritive ratio is much closer, there being one part of digestible protein for nearly 2½ parts of non-nitrogenous matters, while in oat hay there is only one part protein for nearly 10 parts. There are 15¼ pounds of digestible albuinoids in 100 pounds of Flat pea fodder.

Skim Milk for Pigs.—Unless skim milk can be sold at one cent or more per quart, it can be utilized more profitably by feeding it to growing pigs, together with corn meal, gluten meal, wheat bran, maize feed, or gluten feed, all of which have proved healthy and nutritious foods for the production of pork. Experiments at the Massachusetts State station, as reported by J. B. Lindsey (B. 47), show that with skim milk at 13 mills per gallon, or with creamery buttermilk at 14 mills, gluten feed at $22 per ton, and corn meal at $23.50, dressed pork can be produced at from $4.60 to $5.30 per hundred pounds. If the value of the manure be deducted, the net cost of this dressed pork is from $3.30 to $3.80. Experiments made at the Massachusetts and other stations have proved that it is not profitable to feed pigs after they reach a weight of 180 to 190 pounds, excepting, perhaps, when pork brings very high prices. Fed beyond this weight, the food consumed increases, and the percentage of gain in live weight steadily decreases, so that the daily cost of food consumed is more than the value of the daily increase in weight. Where skim milk or creamery buttermilk is used as a part of the daily diet in feeding pigs for market, the following rations are recommended: For pigs weighing from 20 to 80 pounds, two ounces of corn meal to each quart of milk, feeding all the animals will drink; or if the milk supply be limited, substitute four ounces of gluten feed for each quart of milk; or give from one to two gallons of milk daily to each pig, and supplement to satisfy appetite with a mixture by weight of one-third wheat bran and two-thirds gluten meal. For shoats weighing from 80 to 120 pounds, mix four ounces of corn meal with each quart of milk drank; or give a gallon of milk daily, adding, to satisfy appetite, equal parts by weight of corn meal, wheat bran and gluten meal; or six quarts milk daily, supplemented by a mixture of equal parts, by weight, of corn meal and gluten feed. For hogs weighing from 125 to 190 pounds, add six ounces of corn meal to each quart of milk fed; or to the milk at disposal, add, to satisfy the animals, a mixture by weight of one-half corn meal, one-fourth wheat bran, and one-fourth gluten meal; or to six quarts milk add three-fifths by weight of corn meal and two-fifths of gluten feed. The pork thus made is of excellent quality and flavor.

Fertilizers for Cotton.—Experiments through two years at the Arkansas station, by R. L. Bennett and G. B. Irby (B. 23), show that when cotton seed sells for less than $15 per ton, it is more profitable to feed it, or to use it for fertilizer. Cotton seed at $7 per ton is worth more for fertilizer than cotton-seed meal at $20. In using any fertilizer the needs of the soil should be studied from the effect produced in the crop. Homemade manures are recommended as more permanently beneficial to soils and more economical than commercial fertilizers. A system of rotation with field peas, supplemented when possible with homemade manures, will maintain and increase the yields of Arkansas soils without further cash outlay. It is more profitable to feed pea vine hay and cotton seed to stock, and then use the manure as a fertilizer for cotton. The effect of green cow manure on cotton is to prolong growth, while decayed pea vines and cotton seed shorten the period of growth and hasten maturity. Plowing under pea vines, or pea stubble, increases very considerably the yield of cotton, and prevents the disastrous effects of summer heat and drouth. On worn, sandy soils, pea vines are superior to a liberal supply of the usual commercial fertilizers. The peas gathered from the vines, before plowing under, are often worth the cost of the cultivation.

Deep or Shallow Setting of Milk.—In private dairies in the Mississippi valley, a large part of the milk is set in shallow pans, or in deep cans, and skimmed in the ordinary way. In exposure of the milk before creaming, these methods differ much. The deep can is considered superior to the shallow pan, as it may be more nearly submerged in cold water and the milk kept sweet for a longer time in summer, than the milk in shallow pans. Sudden changes of temperature does not so readily affect milk thus set in deep cans. But in winter experiments at the Indiana station, by C. S. Plumb and H. C. Beckman, there was a slight gain of cream from setting milk in shallow pans over that set in deep cans (B. 44). There was a considerable loss of fat in the skim milk from deep setting, over that from shallow setting, amounting to nearly twice as much. The buttermilk from shallow setting contained much more fat than that from deep setting. A slightly smaller amount of milk set in shallow pans made one pound of butter. If the milk is to be set in the open air, and other conditions are equal, it seems most economical to use shallow pans in creaming milk.

Cost of Farm Crops.—At the Nebraska station, an endeavor has been made by C. L. Ingersoll and S. W. Perin, to ascertain the actual cost of farm crops. The crops were given (B. 29) ordinary farm treatment. Labor was charged against the fields at the uniform rate of 15 cents per hour. The profit on a crop depends upon its cost and its market price. The cost is more largely under the farmer's control, the market price being affected by demand and supply. Hickman wheat, yielding 40⅞ bushels per acre, cost 16¼ cents per bushel in the granary; Tuscan Island Red yielded 33 bushels, at a cost of 19⅞ cents; Ironclad 26⅞ bushels, at 23⅞ cents; Extra Early Red 39 bushels, at 26⅞ cents; Landreth White 36⅛ bushels, at 27⅞ cents. White Winter rye yielded 21⅛ bushels, at 39⅛ cents; Prize Cluster oats 34⅛ bushels, at 17⅞ cents; Centennial White corn 43⅜ bushels, at 23⅜ cents; Leaming corn 40⅜ and 44⅛ bushels, at 15 cents; timothy and red clover hay, nearly three tons per acre, at a cost of $1.27 per ton. The cost of a crop depends upon the weather, the price of labor, the fertility and previous treatment of the soil and the skill of the farmer. A single crop may sometimes be raised cheaply, by allowing weeds to grow and returning nothing to the soil, but this would cause a loss in a few years. Any excess of yield above the normal is nearly always clear profit. One man may, by his superior judgment in the planning of his labor, and in the timely treatment of the soil, accomplish much more than his neighbor, who joins farms with him. By the more thorough way in which a farmer does his work, his crops are better able to withstand drouth and escape frosts. The prosperity of a farmer depends upon the profit on the crops and animals raised, and as the cost of raising animals depends upon the cost of food consumed, the profits really depend upon the cost of crops.

Fertilizers for Corn.—In the experiments with fertilizers for maize at the Ohio station by C. E. Thorne and J. T. Hickman (B. 40) superphosphates and potash used separately, or in combination, have as often caused loss as gain, unless nitrogen was added, where superphosphate was useful without nitrogen, gypsum also proved beneficial. Nitrate of soda alone has generally increased the crop, and when combined with superphosphate and potash, has been useful in every test. While there have been cases in which the increase of crop apparently due to the fertilizer has repaid the extra cost, this result could not be repeated on duplicate plots through successive seasons, thus indicating that in such cases the increase was largely due to accidental variations in the soil. The fertilizer experiments on crops grown in rotation offer no more encouragement to the use of chemical manures than those on crops grown continuously. A very wide difference is indicated in the value of stable manure when used fresh from the stable or after half a year's leaching in the barnyard. Apparently the margin of profit in the use of open yard manure is very meager.

Fodder Corn.—Although maize does not ripen in the cooler climates, it still yields immense crops of fodder and silage. A. E. Shuttleworth, of the Ontario station at Guelph, reports yields per acre of nearly 12 tons of early Flint to over 22 tons of late Dent (B. 89). The station tests yielded from one to three tons more per acre than the average farm yield. In nutritive value per acre, the Mammoth Southern Sweet was greatest, followed by the True Leaming, Mammoth Cuban, Wisconsin Earliest White, all of which are Dent varieties. Next came the Compton's Early and Thoroughbred White Flints. Reports from twenty farmers indicate that, in Canada, the heavier yields of fodder corn are obtained from the light, warm soils; and that when land is not especially manured for corn, heavier yields are obtained after such crops as potatoes, roots, or even fodder corn, than after the small grains. Field corn was grown successfully for fodder, after pasture, alsike clover, red clover and rape. The later varieties yield the most fodder, but in growing corn for the silo, earlier varieties should be selected, which will mature sufficiently in the particular locality.

The Cattle Horn Fly.—In some of the Southern States the horn fly is very troublesome to dairy cattle. The treatment is largely preventive, and consists in the application of odorous substances to the cattle to keep away the flies. H. E. Weed, of the Mississippi station, recommends (N. B. 1893) the use of an oil containing one ounce crude carbolic acid, one-half to one ounce pennyroyal, one-fourth pound sulphur and one gallon crude cotton-seed oil, or fish oil, or lard oil. Mix well and apply with a brush or cloth to the back, shoulders and neck of the animal. Fish oil and pine tar mixed and applied in the same way is equally effective. Mixing the tar with the fish oil makes the odor last longer. Either the pennyroyal or the tar mixture will keep off the flies for several days, after which repeat the application. As the horn flies breed in fresh manure, the stables and yards should be kept as clean as possible. The maggots in the manure may be killed with quicklime.

GOOD Leather is leather with Vacuum Leather Oil in it; 25c, and your money back if you want it.

Patent lambskin-with-wool-on swob and book—How to Take Care of Leather—both free at the store.

Vacuum Oil Company, Rochester, N. Y.

FOR

Men's Summer Wear

Choice quality Madras and Cheviot Negligee Shirts and Fancy Business Shirts--blues, pinks and fancy stripes--the comfortable and fashionable Shirt for this season.

Negligee Shirts, cuffs and collars attached, $2.75 each.

Business Shirts, cuffs, but no collar, $2.75 each.

These are made expressly for us and are correct in every particular. They can be sent by mail--neck measure all that is needed.

Many other lines of Wash Goods, in Summer styles, for Men and Boys.

James McCreery & Co.,

Broadway and 11th Street,

New York.

Stand Every Test.

There has never been a time when everything in the form of a remedy was subjected to as severe a test as now. Chemists of national reputation and the highest position are called upon to give testimony in regard to the purity of the ingredients used in medicines.

Allcock's Porous Plasters have triumphantly stood every test and stand to-day at the head, unsurpassed and unequaled. Absolutely pure, they may be applied to the tenderest skin without the slightest danger of injury.

For influenza, coughs, rheumatism, sciatica, lame back, sore throat, sprains, stitches, chest and stomach affections, and aches and pains of every kind,

Allcock's Porous Plasters

are invaluable.

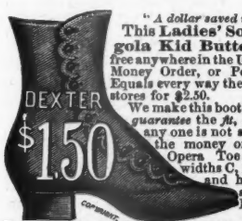
H. W. JOHNS' Liquid Paints

These Paints are composed of pure linseed oil and the highest grade of pigments. They are combined by processes exclusively our own and are unequaled by any in richness and permanency of color. One gallon will cover from 275 to 300 square feet, two coats without thinning and can be safely thinned with ½ gallon linseed oil to one gallon paint for first coat.

SAMPLE CARD OF 56 SHADES, INSTRUCTIONS FOR USE AND SUGGESTIONS FOR PAINTING ETC. FREE BY MAIL.

NEW YORK JERSEY CITY CHICAGO PHILADELPHIA BOSTON ATLANTA

H. W. JOHNS M'f'g Co.



"A dollar saved is a dollar earned."

This **Ladies' Solid French Dongola Kid Button Boot** delivered free anywhere in the U.S., on receipt of Cash, Money Order, or Postal Note, for $1.50. Equals every way the boots sold in all retail stores for $2.50.

We make this boot ourselves, therefore we *guarantee* the *fit, style and wear*, and if any one is not satisfied we will refund the money or send another pair. Opera Toe or Common Sense, widths C, D, E, & EE, sizes 1 to 8, and half sizes. *Send your size; we will fit you.* Illustrated Catalogue FREE.

DEXTER SHOE CO. (Incorp'r'd, Capital, $1,000,000.) Order Dep't, 37 Boston, Mass.

HERE WE ARE AGAIN. Have you missed us? Well, we had to catch up with orders, and the only way to do it was to withdraw all advertising. We have about caught up and want more orders. People say silver is too plenty! We'll take all you will send us; and we'll take gold, paper, or postal notes!

This cut is exact size of our 75c knife, 2 blades, razor steel, and well worth it, but we will mail you one for a while for **48c., 5 for $2.** Our 7-in. shears, **60c.**; knife and shears, **$1.**

Fine 3-blade penknife, **$1.** Lady's 2-blade pearl, **35c.** Pruning knife, **75c.**; grafting, **25c.**; budding, **55c.**; pruning shears **90c.**, postpaid. Hollow-ground razor, **$1.25.** Best strop ever made, **50c.** Razor, strop and 65c. knife for **$2.**

☞ **Send for FREE 80-page list and "How to Use a Razor."**

Maher & Grosh,
633 Adams Street,
TOLEDO, Ohio.

$20 PHOSPHATE FOR WHEAT. ☞ Sold to farmers direct. No Agents. YORK CHEMICAL WORKS, York, Pa.

Patient suffering is no virtue if there be a remedy.

Beecham's Pills

(Tasteless)

WORTH A GUINEA A BOX.

positively cure Indigestion, Biliousness, Sick Headache. Why endure continued Martyrdom? 25 cents a box.

32

includes the great temperance drink

Hires' Root Beer

It gives New Life to the Old Folks, Pleasure to the Parents, Health to the Children.

Good for All—Good All the Time.

A 25 cent package makes Five gallons. Be sure and get HIRES.'

POSITIVELY FREE.

Our Beautiful NEW CATALOGUE, Illustrated with Colored Portraits, and giving full Particulars of all our famous

ORGANS AND PIANOS.

Sold for CASH or on EASY TERMS of PAYMENT to suit everybody.

ORGANS $35.00. PIANOS $175.00.

☞ SEND AT ONCE FOR CATALOGUE.

Write To-day. **CORNISH & CO.,** Washington, New Jersey.

University of the State of New York.

AMERICAN VETERINARY COLLEGE

139 and 141 West 54th St., New York.

19th Annual Session.

The regular course of Lectures commences in October each year. Circular and further information on application to **A. LIAUTARD, M. D. V. M.,** Dean of the Faculty.

FARMING IN FOREIGN LANDS.

The pupils of the agricultural school at Grignon, France, recently held a fête. There were athletic sports in the daytime and a ball at night, and the proceedings were so enjoyable that the pupils propose to arrange for one every year.

On French farms, from 13 to 15 acres is the smallest territory on which a man can live without some other work. Those who have less, eke out their income with job work. So soon as a laborer saves some money he buys land at about $200 per acre.

The number of horses in the Caucasus is less than a million, and their breeding is neglected. In the mountain districts there are excellent animals, enduring and small, but beautiful, though little or nothing is done for the preservation and extension of the breed.

In the coast districts of Queensland, where little or no frost occurs, the following fruits thrive well: Oranges and others of the citrus family, pineapples, bananas, mangoes, grapes, persimmons, custard apples, loquats, guavas, passion fruit, peaches, apples, melons and pawpaw.

At a special show of the agricultural society, Bazan, France, which took place recently, there was an inter-departmental exhibition of resinous produce and pine wood produce. There was also a show of agricultural implements, including those used in ridge cultivation, forest culture, and the production of cattle food.

The good promises of early spring for a full yield of fruit in Europe will not be fully realized. The effects of the long continued drouth, combined with an abnormally high temperature by day, frosts at night, and dry, easterly winds, have caused apples, pears and plums to drop prematurely. Subsequent rains might have moistened the soil to such a depth as to insure a moderate supply of apples, plums, and cherries.

A native Indian agriculturist makes the following suggestion for extirpating white worms from the mango:—(1) Grow vermilion plants under the shade of the mango tree during the flowering season; (2) allow hens, pigeons, and other tame fowls to graze about under them; (3) gardeners should cook their meals under the shade of the trees; (4) during the ripening of the mangoes, they should be washed with water mixed with some insecticide. Kerosene oil mixed with milk might do well.

Growing grass and fodder, cattle breeding, and cheese making, are the most important branches of Swiss agriculture. For ages the forest cantons had little tillable land reclaimed, and only soil superimposed on fragments of rock. The mountains intercept winds and clouds, making the amount of precipitation large. The clouds are generally intercepted by the mountains at an elevation of 5,000 feet, and then descend in rain; higher up the precipitation is in the form of snow.

Mons. le Comte de Salis, an agriculturist in l'Oise, France, has died at the age of 58 years. He was a president of the Section of genie rural of the Society of Agriculturists of France, and one of the most active and devoted members of this large association. The death is also recorded of Mons. Despres, an extensive agriculturist of Ille-et-Vilaine. He paid particular attention to breeding, and his stables were among the largest ones to be found in France.

Of all the vegetable products of the Malay peninsula, gambir is of second importance. It is indispensable in the tanning and silk trades, and is used to a small extent in medicine. The larger portion of the drug that finds its way to market is exported from Singapore, and the average value of the annual exports for the last five years was nearly $4,700,000. The gambir plant is a climbing shrub and its stems are from one to three inches in diameter in the cultivated plant, but more slender when it grows wild.

A Swiss acre of good grass land is worth, in the richer and more populous Cantons, from $300 to $400. Milk, and what is made from it, constitute the most important resource of the peasant's income. The manufacture of cheese is one of the most ancient industries of the country, instruments for this purpose having been found in different parts among the ruins of the "Lake-dwellers," whose date is anterior to all historical records. On wedding occasions it was formerly the custom to present the bride and bridegroom with a large cheese, the joint contribution of the relatives; and this cheese was handed down, generation after generation, as a family register, on which were inscribed births, deaths and marriages.

On the roadsides of Madagascar, between the chief towns in the interior, are invariably to be found stalls for the sale of cooked potatoes as well as the mangahazo and sweet potato. If communication with the coast were more fully developed, there is no reason why potatoes and wheat should not become articles of considerable commercial importance. The latter is cultivated, but only to a very limited extent at present, yet sufficiently to demonstrate the capability of the soil to produce a good harvest.

Jute is largely cultivated in the northern and eastern districts of Bengal, India, and to a smaller extent in the central tracts of the Province. It is also grown somewhat in Assam, the area under crop in these two Provinces being 1,333,000 acres a few years ago, with an output of 1,650,000,000 pounds of jute, more than half of which was exported to Great Britain and the United States. While jute can be cultivated on almost any kind of soil, the best quality is grown upon high lands where rice, pulse and tobacco form the rotation crops.

The English wheat crop of 1892 was 14,000,000 bushels below that of 1891, due to the reduced acreage and very poor results in the last harvest. The most notable decreases in crops were in the production of hay and beans, that of hay being the lowest on record, reaching only 11,500,000, and this year the indications are that it will be even considerably less. The condition of the bean crop in June, 1891, stood at 92.3 per cent., but last year it fell to 74.7 and this year has dropped to the extremely low limit of 69.6, or 30.4 under an average, which represents a most serious loss.

The English special crop reports to the London papers lead to the conclusion that, taking in combination the diminished area under cereals and the unpromising condition under which the growing crops then existed, it cannot be said that the gloomy anticipations of the farmers of Great Britain are groundless. If they are to escape actual ruin, some unforeseen and fortunate circumstances must arise. A continuation of difficulties such as were then being encountered must inevitably lead to general agricultural disaster.

At the French government agricultural colleges, students may enter at 14 years of age, after a strict examination in general knowledge. They pay nearly $90 per annum for tuition, board and lodging, the course lasting three years. There are free scholarships. There are good class rooms, laboratories, also natural history collections. Each day five hours are given to practical work and five to lectures and class work. Each boy in turn spends a week in the kitchen, and a week in taking up and bringing in vegetables from farm or garden. They study chemistry, botany, geology, animal physiology, veterinary science and carpentry.

The import of American corn into Mexico, in 1892, was the most interesting, and, financially, one of the most important, of any commercial event that has occurred between the two countries. Had it not been for the proximity of this food supply, thousands that were very poor must have died for lack of food; as it was, there was much severe suffering, the effects of which will be felt for many years. Roasted ears of corn form an important part of family food, and when too old, but still soft, the grain is utilized in making mushes or gruels. As two crops a year are often raised in Mexico, the period during which green and new corn may be eaten, is considerably increased.

The cultivation of the soil in the Caucasus is still in a very primitive state. The country produces much, it is true; but this is not owing to a rational system of tillage, but rather a consequence of the natural fertility of the soil, which in many localities appears to be almost incredible. The yield of maize reaches 50 to 60, that of rice 30 to 60, and that of millet even 70 grains for each grain planted. There are regions where one grain of wheat produces 40 or 50, and all this with the most primitive system of cultivation. Agricultural machinery is to be seen only on the crown estates and on the very largest holdings, even an ordinary steel plow being a rarity hereabouts.

The chief article of food cultivated in Madagascar is rice, of which there are several qualities found in the same districts, while other varieties have a limited cultivation. Some are planted like wheat, in a moist, light soil, but without any irrigation, as in the forest clearings on the east, where, after burning down a portion of the forest, the rice is dropped into the soil thus manured with the ashes of the timber and brushwood. This is a hard, reddish-colored rice, not held in much esteem by the inhabitants of the highlands. There the rice is invariably grown under water, and considerable ingenuity is exhibited by the people in the formation of their rice fields.

There is great difference in the annual rainfalls in Switzerland, the greatest being as we approach the Alps, whether from the north or south. The annual rainfall is 35 inches at Basel, 64½ inches at Interlaken, 69 at Schwez, rising to 88 on the Grimsel and 102 on the Saint Bernard, and falling at Lugano to 63. The percentage of snow in the total annual rainfall varies from 63 on the St. Bernard to six at Geneva. The importance of this precipitation may be understood when it is recalled that a precipitation of 28 inches is considered essential to security of crops. The meadows are aided in no less degree than the climate by constant fertilizing and extraordinary care in the way of watering and draining.

European grain fields were generally backward this season, and suffered from want of rain. Indian wheat prospects are for an average yield, but harvesting two to three weeks late. European Russia expected a full crop, while the Danube provinces looked only for a middling harvest. Austrian rye is short, but winter wheat is a fair crop. In Germany, wheat as a whole is in a favorable condition, while rye, barley and oats did but fairly well. France reports an average crop of wheat, rye and oats. The wheat fields of England cover less acreage than usual, barley and oats are expected to produce about 90 per cent. of an average yield. In Holland wheat and rye promise an average crop, but oats and barley are backward. Belgium expects a poor yield of barley and oats, though wheat and rye have done well.

The common species of flax is indigenous to Europe, Asia and Egypt. In Great Britain enough is not raised, even in Ireland, where 80,000 acres were cultivated in 1892. Scotland obtains its supply from Russia, where the crop is thinly sowed, producing a coarse fiber. The finest quality is grown in Belgium, where the product brings from $500 up to $1,000 per ton, the crop of flax sometimes selling for more money than the land would realize on which it was grown. Efforts are being made to stimulate the cultivation of flax in Scotland. The average cost of production in Ireland is between $40 and $45, labor there being cheap. Flax thrives best in a good, deep, loamy soil, but it may be raised to advantage on any land not too sandy or peaty, or of a cold, stiff, clay nature. The very best of seed must be used, at any cost. To lessen the cost is to lower the profit.

According to the annual report for 1892 of the Royal Society of Agriculture at Hanover there were 49 new dairy associations formed during the year, the total number for the year being 163. The number of members was 6,170, or an average of 59 to the association. The number of persons who supplied milk without being members was 4,772; the total number of persons supplying milk being 11,611. There were 249 separators in operation; of these 122 were Danish centrifuges, 72 Laval separators, 35 Lefeldt and Lentsch centrifuges, 12 Victoria and six Balance. The milk was priced in 29 dairies according to the contents of fat. In six cases it was analyzed with the lacto-butyrometer, in eight with the lacto krit, in two with the Soschlet apparatus, in two with the Fjord, and in three with the Berg system, while in eight cases the system was not mentioned.

Here is a pleasing glimpse of rural villages in Eastern France, by Betham-Edwards: These villages of the Côte are well built, and, for the most part, clean. There are vines and flowers in every window, and every house possesses an excellent cellar. There may be no parlor-kitchen, and sleeping rooms are, perhaps, incommodious; there is invariably a cellar built on a large scale, and adapted to the proper preservation of wine. On every side are vineyards, and as we gaze we are reminded of the indomitable thrift and laboriousness of the peasant owner. Not an inch of soil between vine and vine is wasted. Where room is not to be had for a fruit tree, we see a black-currant bush, and, where a black-currant bush would be cramped, potatoes or salad. Anything and everything is planted between the vines—asparagus, gooseberry bushes, artichokes, fruit trees, the great object being to waste no soil.

Weak and Poor

In flesh, had a cough all the time, and sometimes I could not lie down for I was so **distressed, short of breath.** I consulted seven physicians, and the conclusion was that I certainly had

Consumption

and my case was hopeless. My husband was in the drug business and sold out to go away, but a friend advised me to take Hood's Sarsaparilla. I did so and have **improved rapidly in health** ever since I began with it. I feel like a new person." MRS. F. O. STONE, Geneva, Ohio.

Hood's Pills cure constipation. 25c.

1,500 TO 30,000 GALLONS OF WATER IN A DAY SUPPLIED BY A DE LAMATER-RIDER ..OR.. DE LAMATER-ERICSSON HOT-AIR PUMPING ENGINE

The Principal

of Rutherford Hall Institute, Passaic Bridge, N. J., Rev. G. NASH NORTON, has a **DE LAMATER-RIDER HOT-AIR PUMPING ENGINE** which pumps **2,000** gallons of water a day from a spring 200 feet from his house, the perpendicular lift being 80 feet. He says he cannot imagine anything more economical or more easily cared for. The Engine does its heavy work satisfactorily with a few small shovels of coal. With one of these engines a farmer can secure a sure and steady supply of water to irrigate his crops, water his stock, or have running water for any other purpose on his farm. The capacity of one of these engines is 16,000 gals. per day.

Send for Illustrated Catalogue to

THE DE LAMATER IRON WORKS,
87 South Fifth Ave.,
NEW YORK, N. Y.

LATEST IMPROVED

HORSE POWER

Machines for **THRESHING & CLEANING Grain,** also **Machines** for **SAWING WOOD** with **Circular** and **Cross-Cut Drag Saws.**

Acknowledged by all to be

THE BEST

regarding

EASY DRAFT, DURABILITY & QUANTITY of WORK.

50 page pamphlet Free. Address **A. W. GRAY'S SONS,** PATENTEES AND SOLE MANUFACTURERS, P. O. Box No. 8, **MIDDLETOWN SPRINGS, VT.**

ROBERT C. REEVES CO., General Agents for N. Y. City and vicinity, **185 and 187, Water Street, New York.**

GRINDING MILLS

ESTABLISHED 1851.

FLOUR MILLS built by contract Roller System.

French Buhr Stone Portable Mills for **Farmers,** 28 sizes and styles.

COMPLETE MILL and SHELLER.

A boy can grind and keep in order. Adapted to any kind of power. **Complete Flouring and Corn Mills;** also for hominy and pearl meal, all sizes. Second hand mills of other makes on hand. Send for Book and how to grind. Address **NORDYKE & MARMON CO.,** 15 York St., Indianapolis, Ind.

WELL MACH'Y *All Kinds, Water, Gas, Oil, Mining, Ditching, Pumping, Wind and Steam: Heating Boilers, &c. Will pay you to send 25c. for Encyclopedia, of 1500 Engravings.* **The American Well Works,** Aurora, Ill. also, Chicago, Ill.; Dallas, Tex.; Sydney, N. S. W.

HAIR ON THE FACE, NECK, ARMS OR ANY PART OF THE PERSON

QUICKLY DISSOLVED AND REMOVED WITH THE NEW SOLUTION

MODENE

AND THE GROWTH FOREVER DESTROYED WITHOUT THE SLIGHTEST INJURY OR DISCOLORATION OF THE MOST DELICATE SKIN.

Discovered by Accident.—IN COMPOUNDING, an incomplete mixture was accidentally spilled on the back of the hand, and on washing afterward it was discovered that the hair was completely removed. We purchased the new discovery and named it MODENE. It is perfectly pure, free from all injurious substances, and so simple any one can use it. It acts mildly but surely, and you will be surprised and delighted with the results. Apply for a few minutes and the hair disappears as if by magic. It has no resemblance whatever to any other preparation ever used for a like purpose, and no scientific discovery ever attained such wonderful results. **IT CANNOT FAIL.** If the growth be light, one application will remove it permanently; the heavy growth such as the beard or hair on moles may require two or more applications before all the roots are destroyed, although all hair will be removed at each application, and without the slightest injury or unpleasant feeling when applied or ever afterward.—MODENE SUPERCEDES ELECTROLYSIS.—

—RECOMMENDED BY ALL WHO HAVE TESTED ITS MERITS—USED BY PEOPLE OF REFINEMENT.—

Gentlemen who do not appreciate nature's gift of a beard, will find a priceless boon in Modene which does away with shaving. It dissolves and destroys the life principle of the hair, thereby rendering its future growth an utter impossibility, and is guaranteed to be as harmless as water to the skin. Young persons who find an embarrassing growth of hair coming, should use Modene to destroy its growth. Modene sent by mail, in safety mailing cases, postage paid, (securely sealed from observation) on receipt of price, **$1.00** per bottle. Send money by letter, with your full address written plainly. Correspondence sacredly private. Postage stamps received the same as cash. (ALWAYS MENTION YOUR COUNTY AND THIS PAPER.)

LOCAL AND GENERAL AGENTS WANTED. } **MODENE M'F'G CO., CINCINNATI, OHIO, U. S. A.** } *Manufacturers of high grade hair preparations. Register your letter at any Post-office to insure its safe delivery* { CUT THIS OUT AS IT MAY NOT APPEAR AGAIN

We offer $1,000 for failure or the slightest injury. EVERY BOTTLE GUARANTEED.

THE ECLIPSE WIND MILL

THE *ORIGINAL* SELF-REGULATING *WOOD WHEEL.*

Will run in **Lighter Wind** and do **More Work** than any other.

FAIRBANKS'

GALVANIZED STEEL Wind Mills and Towers. Pumps, Tanks, &c.

Send for Catalogue and Prices.

FAIRBANKS, MORSE & CO., CHICAGO, ILL.

The Davis Baby Cream Separator and and Feed Cooker Combined.

Completest of outfits for a dairy farmer. This machine has an attachment which, when the bowl has been taken out, is dropped into the Separator so that a belt can run to the churn. Write for further particulars. **Davis & Rankin Bldg. and Mfg. Co., 240 to 254 W. Lake St., Chicago, Ill.,** Manufacturers of all kinds of Creamery Machinery and Dairy Supplies. (Agents wanted in every county.)

Perkins Steel Mills.

Back Geared and Direct Motion.

STEEL MILLS. Built for durability and power, Long Shafts, Bearings, Crank Pins; has Graphite Bearings which take the place of oil. **No Climbing Tower.**

STEEL TOWERS 30, 40, 50 and 60 feet in height, made of Angle and Channel Steel. **Built different from any other make.** Each band and brace adds strength to corner post. Every part of *Steel in Mill and Tower perfectly Galvanized.* Get our Catalogue before buying. Address, **PERKINS WINDMILL CO. Mishawaka, Ind**

1854.-Established 39 Years.-1893.

GEM STEEL

THE OLD RELIABLE

HALLADAY STANDARD, HALLADAY GEARED and U. S. Solid Wheel

WIND MILLS

Guaranteed to be the BEST MADE.

Also Pumps, Tanks, Corn Sheller, Feed Mills, Stalk Cutters, Haying Tools, Saw Tables, Etc.

SEND FOR CATALOGUE.

U. S. WIND ENGINE & PUMP CO.
115 River St., BATAVIA, ILL.

The Victor

CANE MILL

LEADS ALL OTHERS

For correct proportions, great strength, smooth action and cleanliness. Fifty-two Grand Awards and the endorsement of twenty-five thousand users, tell the story better than words.

We make more kinds and sizes of

Cane Mills, Evaporators, etc.,

Than any other house in the WORLD.

The BLYMYER IRON WORKS CO.,

Send for Catalogue. **CINCINNATI, OHIO.**

---

510 Riverst. FREEPORT ILL.

We will furnish the most economical roofing and siding, all styles. Also Metallic Shingles from Iron or Steel with full directions and low prices.

GARRY IRON ROOFING CO., Cleveland, O.

Mention Agriculturist.

THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

ANIMAL AILMENTS.

Tapeworm in Sheep. — L. Hays, Carbon Co., Wyo.: Sheep may suffer from turnsick from the effect of the immature tapeworm of the dog. The embryo having escaped from the egg of the tapeworm bores its way through the tissues and enters a blood vessel, and thus is carried to the soft and comfortable quarters in the brain; it grows to a considerable size before causing trouble, when pressure is made upon the brain, causing the animal to move around towards the side on which the pressure is made. In sheep, if any thinning of the skull can be found by its yielding to pressure, trephining may enable the removal of the encysted parasite. The surgery in cattle is more obscure than in sheep, where the pressure has thinned the bone by absorption. Slaughter the animal, if fat enough.

Indigestion in Mare.—F. Allen, Delaware Co., N. Y.: Regular exercise is better than medicine for a brood mare, or any other horse having simply indigestion. Long fasting, long and hard driving, immediately followed by a double feed to make up for the last one, is a frequent cause of indigestion of a troublesome kind to cure. A little rest, and a light feed of roots and bran, will do far better than a peck of oats, or of corn, after a hard day's drive with loss of a meal. A feverish, tired and empty stomach needs rest and a mild stomachic, rather than an overflowing measure of heavy, coarse food. A few swallows of water, in which a handful of oatmeal is stirred, will always prove grateful to the jaded horse. The full meal should be given later.

Fits in Animals.—M. Goskirk, Dawes Co., Neb.: Fits in dogs and other animals result from overfeeding and too close confinement, indigestible food, worms, or some derangement of the system. It is not contagious, but every precaution should be taken to remove any exciting cause. The treatment is unsatisfactory. But as a precaution against any derangement of the stomach, a box containing equal parts of wood ashes, salt, and powdered charcoal, should be kept within reach of all herbivorous animals. This combination possesses, especially for swine, a sort of panacea. The ashes are antacid; the salt a stimulant to the glands of the stomach, as well as a vermifuge; and the charcoal is an absorbent, antiseptic and deodorant, or sweetener. One volume of good charcoal will absorb one hundred volumes of ammonia gas, fifty of hydrogen sulphide, and ten of oxygen; and the oxygen retained deodorizes noxious gases as they come into contact with the charcoal.

Brain Worm.—Peter Melius, Lane Co., Kan., has a bull that holds his head high, and goes towards the right instead of straight forward. He is half stupid, and is of no use for service; is getting thin and rough. It is probable that there is an encysted tape worm in the brain. It is possible that there may also be a hydatid worm between the two hemispheres of the brain. If the bull is in a fit condition for slaughter, the sooner he is disposed of in that way the better. Tapeworm eggs, voided by sheep dogs on the grass of the pastures may be eaten with the grass and find their way into the brain, and there go into the cyst or bladder form and thus ultimately kill the beast, by creating inflammation or compression of some portion of the brain. Salt and iron is a powerful and efficient agent against the tapeworm inhabiting the bowels. It is suggested that a box containing one pound of powdered sulphate of iron, a peck of wood ashes, ground charcoal a quart, and two quarts of salt should be kept in reach of all of our stock, under a shed, or where it will not be washed away by heavy rains. Salt is a worm destroyer, charcoal is an antiseptic, ashes are anti-acid, and iron a tonic.

Stringy Milk.—Gilbert Scaskoltz, Stork Co., Pa., asks what is the reason that some cows give stringy milk during three or four of the hottest months of the summer. In Norway and Sweden the people are fond of slimy milk as an article of diet, and have found a method of producing slimy milk artificially. There is no accounting for taste. These northern dairymen, having a love for slimy milk, procure it by rubbing the interior of milk vessels with a plant by the name of *Pinguicula vulgaris*, or by putting the stem of this plant in the milk, or, more simply, by feeding the plant to the cows. There is a slimy fermentation of milk, which occasionally gives great trouble in dairies. Slimy milk has an important bearing upon the manufacture of Edam cheese. But elsewhere this fermentation is a troublesome one, since it destroys the milk for all ordinary uses. Such milk will furnish no cream, it cannot be churned, and is ruined for drinking purposes in most parts of the United States. Slimy milk is the product of microscopic organisms which get into the milk subsequent to the milking. Cleanliness is the remedy for this and many other milk troubles.

Epilepsy in a Pig.—Jas. Karner, Sangamon Co., Ill., has had a strange experience with a pig. A nine-months' sow farrowed thirteen pigs. All did well till one morning he noticed one pig stare queerly, champ the jaws, foam at the mouth, stagger, and then sit down, with the head thrown back and the nose in the air, moving from side to side, the body jerking. Suddenly it fell over on its side, struggled, and then lay so still that it was supposed to be dead. But after awhile it jumped up, and seemed blind, for it ran its head against the fence. A dose of castor oil was attempted, which set it into another fit, and it soon died. The stomach, bowels and other organs seemed perfectly healthy, and of natural color. In a fit a small stream of cold water poured upon the head will break the fit, but until those are over, medicinal treatment should not be tried. The trouble originates in the brain, or nervous system, and requires laxative green food, clean pen, or better pasture, and clean drinking water.

Saltpeter as a Poison.—Corneleus Selew, Mojave Co., Arizona, states that he has always kept rock salt in the yards where the sheep are for a short time kept, and having got out of rock salt he had a half-bushel measure of salt placed. Some of the sheep were seen to eat freely of the salt, which caused them to drink a good deal. A number became dull, refused food, and a part of the sick sheep died. They were opened and nothing could be found in the stomach or bowels, which were slit open the whole length. There was a little redness in the stomachs. None but the ewes in lamb died. This salt seemed to poison these ewes. It must have contained saltpeter, or some enemy may have put saltpeter on the range of the herd. It has been found that an excess of salt is a poison to pregnant sheep. While it is healthful to fowls to have a little salt in their food, it is a deadly poison to young chicks. Nearly every farmer has lost fowls by emptying a pork or beef barrel of its salt and bits of fat, which bits of fat the fowls eat voraciously. They soon run for water and drink to appease their thirst. Sheep, horses and cattle will not take an overdose of salt if they have access to it at all times.

Pantas, or Wood-Evil.—Albert Watts, Coso Co., Texas: Pantas is a form of gastro-enteritis, due to coarse, acrid, dried up, unusual food. It is seen in long dry summers when grasses are burnt up and scanty. Cattle then eat anything and everything, dried hard grasses, leaves, oak buds, pine, cedar, or weeds. The symptoms are all the signs of indigestion and constipation, manifested in a marked degree. Nearly the entire herd suffers. Diarrhœa or dysentery precedes great debility and death. Large numbers die. The urine, scanty, high colored, and voided with difficulty. The juices of the animal are dried up. Milk ceases at its fountain head. The appetite is depraved or totally lost. The poor brutes become wild with suffering. Autopsy shows lean and starved bodily tissues, and the fatal lesions of advanced dysentery, eating ulcers and gangrene. The treatment is castor oil and laudanum, repeated at intervals. Give stimulants and tonics, mucilages, milk punch or eggnog, and a liberal and nutritious diet.

Cough of a Horse.—O. F. Anderson, Knox Co., Ill., has a horse that coughs when driven. He has a good appetite, and is a gross feeder; eats all that is given to him, and every particle of bedding, drinks two pails of water, and seems never satisfied, yet he keeps in thin flesh. He is a remarkably free driver, and is always ready to go, without being urged by word or whip. The horse has a stomach cough. The horse's stomach is very small, as compared with that of the ox; and, when stuffed, the sensitive nerves of the stomach sympathize with the heart and lungs, causing deranged breathing and heart action, as shown in the stomach cough. As a rule, a horse should be watered and fed an hour before being driven. Drive slowly at the start, till the horse's bowels have become pretty well emptied, and the stomach, no longer oppressed, will not excite the cough. To overcome the indigestion, which is indicated by the depraved appetite, a laxative tonic should be given with the morning and evening feeds: Sulphate of iron, two drams; gentian in powder, one dram; ground ginger, one dram; sulphate of soda, two ounces; whole flaxseed, a handful. In no case should the acute stage of indigestion be allowed by neglect to pass into the chronic stage. The lack of condition shows that this stage is beginning to show itself. There are few affections of animals that show such abject misery of appearance, or such a degree of worthlessness of service, as chronic indigestion.

To Prevent Galls.—Every part of the harness should bear level and smoothly upon the working animal. The harness should be kept clean, as well as the skin and coat of the horses, where long and steady work is exacted. The harness should be kept soft and pliable. The collars should fit and be kept clean. Sweat and dust soon chafes and makes the skin break. The acid sweat is a source of irritation and will soon gall the tender skin of the finest-bred horses. A buckle, seam, knot, or even roughness on the harness, will bruise or chafe into a bad gall, if neglected. Every work horse should be well groomed daily, and where there is irritation or tendency to soreness, the part should be washed with cold water. Often the addition of one part of alcohol to six of water will toughen the skin so that galls may be prevented. This prevention is the best part of the cure. When a chafe or gall is observed—and daily observation should be imposed as an important part of a driver's duty—the harness should be so shifted as to remove the pressure upon the sore. Small horse-hair pads may be fastened to the harness so that the sore is protected from pressure. In double teams, a change of harness from one horse to the other may be useful.

Nervous Debility.—Walter Silver, Hancock Co., W. Va., has a cow that cannot get up. There does not seem to be anything the matter with her. She eats and drinks well, and gives a good pail of milk, more than is handy to milk. The only thing unnatural about the cow is that she does not have as much passage as she ought for an animal that eats so much. From this history of the case there can be no doubt that the cow has nervous debility from too frequent breeding, and too profuse lactation. In these cases, constipation is the most marked symptom. Give half a pound of Glauber's salts; two ounces of ground gentian in linseed tea and bran to make a very soft mash or slop. But, as the cow cannot exercise, it will be well to give large enemas of warm soapsuds every two hours till the bowels are well moved. As sulphate of iron is astringent, it will be best to give colombo and gentian each one ounce; and one grain of strychnia, in flour and flaxseed gruel or tea, twice daily. The currycomb and brush should be freely used, and the stall should be kept scrupulously clean, and perfectly dry. Fatten the cow for beef instead of breeding her.

Eczema—Cracked Heels.—E. C. Bravo, Cook Co., Ill., wishes advice in reference to cracked skin in the fetlocks of the fore feet of a valuable race horse that bleeds and becomes sore every time he is raced or exercised on a gallop. Besides the soreness, the legs swell. Warm linseed meal poultices applied two or three times a day for a week, until the fever and swelling are removed, will do well. The hair about the cracked heels should be cut close before poulticing, and the parts thoroughly, but gently, cleansed with castile soap and quite warm water, after hand-rubbing the legs. At night the poultices should be removed, the parts washed, dressed with Goulard water, two ounces, aqueous solution of opium one ounce, soft water, 20 ounces; mix and apply warm, cover with a fold of soft linen, and apply flannel bandages from foot to knee. This application may be alternated with powdered sulphate of zinc one dram, soft water 10 ounces. If the discharge is offensive, two-ounce doses of hyposulphite of sodium may be dissolved in the drinking water for a day or two. A bran mash, or carrots at midday, will keep the bowels in a good condition. Should the urine be thick and strong smelling, two drams of niter may be given in the drinking water at night.

The Season in Central Michigan.

In common with other parts of the country we have suffered from excessive rainfall in May and June, which, added to the cold, backward season, retarded vegetation of all kinds, and made seeding much later as well as smaller in acreage than usual. Less oats and corn, and more beans and potatoes is the result, as the latter could be put in after it became too late for the former. Hay is a very good crop this year in this section. The weather during haying was favorable for securing it, and most of it was put into the barns in good shape. Wheat is below the average; from 10 to 15 bushels to the acre as a rule, and, in some cases, less than that. Oats are very light owing to wet weather and small acreage. Not much barley and rye are raised here, but what there is yielded a fair crop. Late potatoes, for which this State is noted, will be good if late rains come in season, as the prospect is good at this time. Beans also will be a good crop, and are a paying one to raise.

Apples are a failure as far as go. There is no winter fruit, and only a small amount of the autumn varieties. Peaches are good, also small fruits. Pears rather light. Not as much seeding to wheat will be done this fall. The low price wheat has brought for the last year has discouraged farmers entirely. Wheat has always been our principal money crop. Dairying is still gaining in favor. Sheep raisers are discouraged, and, as a consequence, are offering stock at a low figure. There is no money in sheep unless one raises lambs for early market. Cattle are on the rise to keep pace with hogs. Hogs are scarce and high. An unusual fatality among young pigs seemed general last spring, and many farmers were obliged to buy for their own use. Everything considered, this has been a fairly prosperous season in Michigan.

ELLA ROCKWOOD, Genesee Co., Mich.

Tulips for Winter Blooming.—A. L. Hawley, Washington Co., Vt.: Bulbs grown in the garden, provided they are sound and of early varieties, will do very well for indoor growth. Pot them as soon as convenient, putting three bulbs in a six-inch pot. Plunge them into any out-of-the-way garden bed, and cover with coal ashes to the depth of ten or twelve inches. About the first of December bring a few of the pots into the house, and a few more at intervals of about three weeks. Place them in a sunny window, keeping them supplied with water when needed, and they will flower in about six weeks.

Violet Growing for Amateurs.—E. C. Francisco, Berks Co., Pa.: Take runners from the old plants in spring; set out the same as vegetable plants, and keep growing until the middle of September, when they should be taken up and planted in a frame nine inches apart each way. The frame should face the south, and be protected against the northern winds. Do not cover with sashes until there is danger of freezing. Water the plants carefully. After the sashes have been put on they should be raised whenever the weather permits, as free circulation of air around the plants is absolutely necessary. The plants should not be more than ten inches below the glass, in rather heavy, loamy soil, made rich with well-decomposed manure. Upon the approach of cold weather, mats should be in readiness for covering the sashes. Violets succeed best in a low temperature, providing it does not reach the freezing point.

BEST POLISH IN THE WORLD.

RISING SUN STOVE POLISH

DO NOT BE DECEIVED with Pastes, Enamels, and Paints which stain the hands, injure the iron, and burn red. The Rising Sun Stove Polish is Brilliant, Odorless, and Durable. Each package contains six ounces; when moistened will make several boxes of Paste Polish.

HAS AN ANNUAL SALE OF 3,000 TONS.

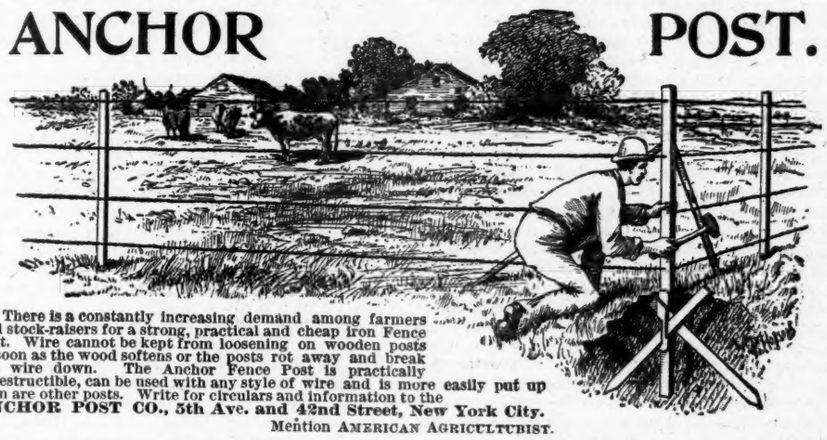
EMPTY IS THE KITCHEN— BRIDGET'S GONE.

Because they did not use GOLD DUST Washing Powder. Sold Everywhere.

MADE ONLY BY N. K. FAIRBANK & CO., · · CHICAGO,

St. Louis, New York, Philadelphia, Boston, Montreal.

ANCHOR POST.



There is a constantly increasing demand among farmers and stock-raisers for a strong, practical and cheap iron Fence post. Wire cannot be kept from loosening on wooden posts as soon as the wood softens or the posts rot away and break the wire down. The Anchor Fence Post is practically indestructible, can be used with any style of wire and is more easily put up than are other posts. Write for circulars and information to the ANCHOR POST CO., 5th Ave. and 42nd Street, New York City.

Mention AMERICAN AGRICULTURIST.

CATALOGUE FREE.

A FAIR GOOD BETTER BEST BUGGY — FOR $45.00 $55.00 $65.00 $75.00

BUY of the *Manufacturers*. SAVE *Middleman's profit and Traveling man's expenses*. Buggies, Phaetons, Surreys, Wagons and Carts. We are the only manufacturers willing to ship you any vehicle in *Catalogue* to be returned to us, at our expense, if not found as represented.

PIONEER BUGGY CO., Columbus, Ohio.

All Vehicles Warranted for two years. Capacity 100 finished vehicles daily.

BUY A Morton Tread Horse Power! Why?

It is the easiest and quickest moved and set.
It occupies less floor space than the sweep power.
It has an adjustable elevation and does not require a driver.
It has a perfect automatic governor to control the motion.
It is sold direct to the user and fully guaranteed.

Also manufacturers of Corn Huskers, Feed Cutters, etc. Write for special 1893 prices. Address

MORTON MANUFACTURING CO., Muskegan Heights, Mich.

ERTEL'S VICTOR HAY PRESS

SHIPPED ANYWHERE TO OPERATE ON TRIAL AGAINST ALL OTHER HAY PRESSES. PURCHASER TO KEEP ONE DOING MOST AND BEST WORK FOR MONEY. NO BOOKS NO NOTES

GEO. ERTEL & CO. QUINCY, ILL.

$20 Buy Direct and Save 50 Per Cent.

All riders say they cannot see how we can do it for the money: $20 buys an elegant Oxford finely finished and nickel plated Bicycle, warranted to be first class, simple in construction, strong, durable and accurately fitted, which makes riding on our Wheel a pleasure instead of hard work; material we use is of the highest grade, each wheel guaranteed. Write to-day for our illustrated FREE catalogue.

DEPT. S.—OXFORD MFG. CO. 338 WABASH AVE. CHICAGO.

TOPICS OF THE TIMES.

Agriculture in the Public Schools.

The teaching of agriculture in the public schools has been successfully solved in France, where it was found advisable to supplement the work or compromise the system of agricultural colleges by making agriculture a special study in the general school system. The work was begun by training the teachers first, and "while general methods have been prescribed, the system is sufficiently elastic to meet the varying abilities of teachers and pupils," although the system is, as yet, in its infancy. The greatest difficulty in introducing agriculture into the public schools of America will be found to lie in the teacher. It has also been objected that the course of study in our public schools was already overcrowded. But, as Mr. James, the deputy commissioner of agriculture for Ontario, pointed out in his comprehensive address on the subject, some months ago, it is not necessary to add more studies, but the principles of education should be taught in their relation to agriculture, thus creating the sentiment in favor of the farm, and developing a love for the country and its healthful life. In teaching arithmetic, the problems could refer to measurements, and the like, in the various lines of farm work. In history, the great progress of agriculture in its manifold relations could be taught, along with the ordinary course of reading. So, too, with other studies, while composition and rhetoric afford further opportunity for the diligent teacher to interest scholars in matters pertaining to the fundamental industry of the continent.

This natural system of implanting in the minds of our youth a knowledge of and reverence for agriculture, is the essential object to be attained. Its further development in the line of special text books for advanced schools, preparatory to our agricultural colleges, is a simple matter, compared to this great work.

Beet Sugar in Asia.—Many places in Asia formerly supplied with cane sugar from the East Indies are now using beet sugar from Russia. Experiments with sugar beets have been tried at the eastern end of the Caucasus Mountains, in the Baku province of Georgia, and a large sugar factory is being built near the city of Baku, on the Caspian Sea. Petroleum from the oil wells of that region will be used for fuel. The output will be shipped by water to the vast territory bordering on the Caspian, and especially to the markets of Persia, which are now supplied with Russian beet sugar, which is subject to a long and costly overland journey before reaching the inland sea. There is also railroad communication with the port of Redut Kale, on the Black Sea. Thus the millions of Asia are being steadily carried onward by the progress of civilization.

A National Board of Health.—That we are just now living through and making an epoch in the knowledge of the diseases of men and the lower animals, which is full of promise for the welfare of individuals and of nations, is the careful statement of Dr. T. Mitchell Prudden in the *Century*. Recent investigations have shown that the most deadly diseases, such as tuberculosis, pneumonia, scarlet fever, cholera, small pox, measles, yellow fever, malaria and others of the devilish brood, are caused by minute organisms feeding on the living body, and are not inevitable accidents, even under the most complex conditions of life. When to-day we hear that a useful citizen has fallen by the way stricken with typhoid fever, or when diphtheria claims the light of the household, we know that ignorance or carelessness, be it private or official, is alone to blame. It may be the milk, it may be foul dust, or water, or clothing, or houses, or the filthy folly of trailing skirts along the foot ways, which has brought the noxious germs to the victim. But sanitary science is far in advance of sanitary practice. For the effectual prevention of bacterial disease, the people must know wherein the great sources of danger lie, and that by simple, intelligent cleanliness, these sources of danger may be largely sealed. It is also necessary that the people appoint Boards of Health, to see to it that water supplies are kept unpolluted; that human waste is safely disposed of; that food supplies are not infected; that roads, streets and other public places are kept clean; that over-crowding in schools, tenements and lodging houses is not allowed; that proper measures of isolation, disinfection and cleansing shall be practiced in all cases of infectious disease; and that in all other things the public health is guarded. At the head a National Board of Health should act, because the Federal Government in every crisis, through the various arms of the public service, is able to command an amount of expert coöperation entirely beyond the reach of any State. The study of the effects of certain diseases of cattle upon man is of the utmost importance, and could thus be most efficiently done. In the matter of health we are forced to be our brother's keeper.

The Sun-Motor for Irrigation.—In arid regions the clear atmosphere transmits a greater amount of the sun's heat, and the absence of clouds gives sunshine to nearly every day. A large sunshine reflector, 20 by 35 feet, has just been made, to furnish energy to a ten horse-power Ericsson hot-air pumping engine to be used on an irrigated farm in Arizona. In climates where clear weather prevails almost continuously, the sun-motor is practicable for work like pumping which can be carried on intermittently, by the use of water tanks and large storage reservoirs. By erecting such plants in the Rocky Mountain deserts, not only would the irrigation farmer be greatly benefited, but by converting the power into electricity and storing it, it may become possible to make good use of the dreaded sunshine, at any hour, and for distant work.

Side Lights on the Louisiana Sugar Industry are afforded by an old resident and very competent observer, whose remarks are interesting. In the course of a discussion of the prospects for the cane sugar industry, he writes: Recently I have read two articles on sugar; a very able one from the AMERICAN AGRICULTURIST, and the other "The Sugar Industry," in the "Times Democrat" of New Orleans. Each should be read by every intelligent voter, as the former defines the correct position which sugar should occupy from a national and non-partisan standpoint, and the other shows the opinions entertained on sugar by those who are strong protectionists for sugar beet, who revile the McKinley bill and desire "sweeping tariff reform (which means free trade) ignoring that what follows in regard to sugar may apply with equal force to other industries." As I interpret the law, the bounty on sugar was given to enable those interested in the industry to so improve their plant that they would secure the maximum amount of sugar from the canes at minimum cost. What are the facts, pride or a want of a just conception of the inevitable, cause men to invest capital in establishments where an average of 150 pounds of sugar cannot be had, where an output of 200 pounds should be made.

It has long been evident to me that the bounty would sooner or later prove prejudicial to Louisiana. The margin is now-a-days so small that to make the manipulation of sugar profitable, it is necessary that the planter should work on a large scale or be forced out of existence, and the sooner this is fairly understood, the better it will be for all interested parties. But to do so effectually the peculiar pride attached to the word "planter" must be first completely eradicated. Are the masses to be taxed to pander to such pride? I know men who have not first class factories, and who are not intelligent agriculturists, yet last year cleared by the aid of the nearly two cents bounty, an amount greater than the salary of the president of the United States. They received in bounty on the sugar made per acre, more money than an equal area of average Western farm lands will sell for cash.

Important to Breeders of Swine.—The National Swine Breeders' Association will hold its annual meeting in Assembly Hall, World's Columbian Exposition on Friday, October 13. This meeting occurring during the last and most important week of the Swine Exhibit will be largely attended. The program, consisting of papers from leading breeders and prominent scientists, and treating on practical rather than theoretical matters, will be interesting and instructive. Individual swine breeders as well as swine associations should not fail to attend or be represented at this meeting, or, if unable to be present, secure membership in the National Association, so that they may receive the benefits of its proceedings, papers, discussions, etc., which will be published for use of members. The secretary is Jno. G. Springer, Springfield, Ill.

Improvement at the Fair Grounds of the New York State Agricultural Society.—Secretary G. Howard Davidson informs us that several important improvements are in progress at the Fair Grounds, Syracuse, with a view to having the next fair which will be held from September 14th to the 21st, one of the most successful in the history of the society. The most important improvement will be a large, handsome horticultural hall, for the exhibition of fruit, flowers and vegetables. A permanent poultry building is also in the course of erection. Two new horse barns will be added to those already in existence. A working dairy and lecture room will also be erected and all necessary improvements and repairs will be made to have the grounds and buildings in perfect condition.

More Than Satisfied.—I am more than satisfied with the AMERICAN AGRICULTURIST, and fully appreciate the efforts of the editors to make the periodical more and more interesting.

J. B. COMINGS, Cape of Good Hope, Africa.

Why?

Why is Strictly Pure White Lead the best paint? Because it will outlast all other paints, give a handsomer finish, better protection to the wood, and the first cost will be less.

If Barytes and other adulterants of white lead are "just as good" as Strictly Pure White Lead, why are all the adulterated white leads always branded Pure, or "Strictly Pure White Lead?" This Barytes is a heavy white powder (ground stone), having the appearance of white lead, worthless as a paint, costing only about a cent a pound, and is only used to cheapen the mixture.

What shoddy is to cloth, Barytes is to paint. Be careful to use only old and standard brands of

Strictly Pure White Lead

"ANCHOR" (Cincinnati)	"KENTUCKY" (Louisville)
"ARMSTRONG & McKELVY" (Pittsb'gh)	"FAHNESTOCK" (Pittsburgh)
"ATLANTIC" (New York)	"LEWIS" (Philadelphia)
"BEYMER-BAUMAN" (Pittsburgh)	"MORLEY" (Cleveland)
"BRADLEY" (New York)	"RED SEAL" (St. Louis)
"BROOKLYN" (New York)	"SALEM" (Salem, Mass.)
"COLLIER" (St. Louis)	"SHIPMAN" (Chicago)
"CORNELL" (Buffalo)	"SOUTHERN" (St. Louis and Chicago)
"DAVIS-CHAMBERS" (Pittsburgh)	"ULSTER" (New York)
"ECKSTEIN" (Cincinnati)	"UNION" (New York)
"JEWETT" (New York)	

are strictly pure, "Old Dutch" process brands, established by a lifetime of use.

For colors use National Lead Co.'s Pure White Lead Tinting Colors with Strictly Pure White Lead.

For sale by the most reliable dealers in paints everywhere.

If you are going to paint, it will pay you to send to us for a book containing information that may save you many a dollar; it will only cost you a postal card to do so.

NATIONAL LEAD CO.,

1 Broadway, New York

California Agricultural Lands.

Since I have been writing for the AMERICAN AGRICULTURIST, I have received a large number of letters from persons who wished to come to California. I have answered most of these letters, often at my own expense for postage; in some cases a long and interesting correspondence has followed. So many suggestions and experiences of general value necessarily mingle, and repeat themselves in such correspondence, that I desire to place some important points before the public in relation to the conditions of life here, the things to avoid, and the matters to look for.

The State is large, thinly populated, full of undeveloped resources, as any one who studies the holiday editions of our newspapers can see for himself A very extensive area of land is for sale at some price, high or low; there seem to be many changes going on; the lists of reputable real estate men are crowded. At the same time, the profits of men of ability and means, in a great number of special industries, are large, and likely to remain so My first suggestion is that it is exceedingly difficult to make a choice where soil and climate vary so much, but that the probabilities are that men of moderate means can buy partly improved places to greater advantage than they can buy the naked land. There are government lands, State university lands, railroad lands, and lands in private ownership. The university lands are nearly all sold, but some of value remain, and the terms are easy and prices low. The railroad lands comprise very extensive tracts, of all grades, in nearly every county of the State, and many people have found their best opportunity in these lands. The colonies, in number innumerable, represent every conceivable type. Some are successful, and some are conceived in fraud and ignorance.

No State has suffered more than California from irresponsible land-boomers. Whenever strangers, full of enthusiasm, come here, the land-boomers try to swindle them. They charge too much for the good land; they try to sell worthless land at the price of first-class land; they exhibit fruits, wines, etc., grown on fertile soil, in a good climate, as the product of barren, windy hill tops, or burning desert sands. This very summer I have seen several flagrant instances of such swindles called Colonies. One on alkali soil ruined a number of Western settlers.

The alkali soils of the State represent a wide range of difficult soils to handle. The worst of them are useless in this generation. They look black and strong, and the professional land-boomers plow them up before they show them to purchasers. I have seen black alkali lands, upon which neither wheat, corn, alfalfa, fruit trees, nor any other crop could be grown. The natural vegetation was only a coarse weed, useless for fodder; in some patches, not even this weed would grow, and the alkali was so strong as to prevent all vegetation. The roots of a tree or vine planted in such soil are corroded and destroyed by the alkali; seeds cannot germinate, or if a feeble growth begins, no fruitful results need be expected. Such tracts, though containing the elements of vast fertility, must be treated expensively with gypsum (land plaster), must be underdrained, and the superabundant alkali leached out by irrigation. This is the problem of large tracts in the midst of famous and fertile districts. No settler, coming to California, should get such lands, unless he does so with his eyes open. It is easy to have suspected soil tested, and the amount and character of the alkali determined. It must not be forgotten that the regions of light rainfall, where alone the surplus alkali is found, are also the regions where some of the most marvelous horticultural results are being achieved upon lands more immediately available. But the stronger alkaline soils can only be reclaimed by capitalists, willing to spend large sums, and years of time. They are not for men of small means.

Again, there are, as people know, districts where water is scarce, where, perhaps, the irrigation supply is not yet determined, or is in litigation. Sometimes the water used may be of poor quality, it may even contain alkali. The would-be settler must investigate the sources of water supply, the cost, and the permanence, as well as the quality of the soil, before he feels safe. The diversity of soils and climates in California, leads to a multitude of errors in settlement. Because you find a man who has a profitable orange grove or prune orchard, in a sheltered valley, is no proof whatever that you can duplicate the same, three or four miles distant. Wind currents, elevation, and many other elements must be considered. Nevertheless, the intelligent outsider often arrives at a more correct conclusion than the old-timer, whose knowledge is only empirical. It was the newcomers in Southern California, who developed the wonderful horticulture of the bench lands, while the old settlers were clinging to the moist, frosty "bottoms."

Perhaps some of these things I am saying will deter people from coming to California, but they should be said, nevertheless. Sensible people will be able to understand that, while California may and does contain homes for many thousands more, it is so serious a matter for families to leave their old association, and seek new surroundings, that the greatest care should be taken to insure their happiness.

C. H. SHINN, Alameda Co., Cal.

Fall Sowing of Hardy Perennials and Annuals,—L. B. Hovenden, Ontario, Canada: As a rule seeds of hardy herbaceous plants should be sown as soon as they are matured, as then they germinate quickly, and the plants will become sufficiently strong to withstand the winter. The young plants should have some slight protection of leaves, or some other mulching material, during the winter season, With annuals, however, it is better to defer the sowing until the following spring, as the alternate freezing and thawing in Northern latitudes more than counteracts what good may come from autumn sowing.

Ants Infesting a Willow,—Jarvis W. Shearer, Cuming Co., Neb.: We are not quite certain, but are inclined to think that the ants, which you find working under the bark of the willow tree, are merely cleaning out the excrement of some kind of borer which has been, or is still, working in the tree. Cut away all the dead bark and scrape off the loose dead wood, and as far as it may extend; then paint the wound with pine tar, or even with common mineral paint and oil, to prevent any further decay and insure healing over of the wound. Ants rarely injure live and healthy wood, but often clean out dead and decaying parts of trees, making their nests in the cavities secured in this way. Do not attribute the injury to the ants until you are certain that they are to blame, for it is far more likely that they are feeding on the borers than that they eat the tree.

GIVE · THE · BABY

MELLIN'S

FOR INFANTS AND INVALIDS.

TRADE ORA ET LABORA MARK.

FOOD

IF YOU WISH your infant to be well nourished, healthy, and vigorous.

THE · BEST · FOOD

For Hand-Fed Infants, Invalids, Convalescents, Dyspeptics, and the Aged.

Our Book for MOTHERS,

"THE CARE AND FEEDING OF INFANTS,"

Mailed free upon request.

DOLIBER-GOODALE CO., BOSTON, MASS.

PAINSFOE

THE HOUSEHOLD REMEDY FOR PAIN.

Mild, effective, contains no opium. Cures Neuralgia, Sciatica, La Grippe. Rheumatism, and all bodily pains.

Warranted to Cure any Headache in 10 minutes. Sample and book sent FREE. Box containing 75 doses—Price 50 cts.—at druggists or by mail.

PAINSFOE CHEMICAL CO., 87 College Pl., N. Y.

Try it on

the dog. It will do him good; or his master. When a horse gets cut, bruised or chafed, there's nothing like Phénol Sodique to put on.

HANCE BROTHERS & WHITE, Philadelphia.

At druggists. Take no substitute.

EVERY MOTHER SHOULD Have It in The House.

For the common ills of life liable to occur to any one.

Dropped on Sugar, Children Love to take it for Croup, Colds, Sore Throat, Cramps and Pains.

JOHNSON'S ANODYNE LINIMENT

Was originated and first prescribed by AN OLD FAMILY PHYSICIAN.

For INTERNAL as much as EXTERNAL use.

Generation After Generation *Have Used It.*

SOOTHING, HEALING, PENETRATING

Could a Remedy WITHOUT REAL MERIT

Have Survived for Eighty Years?

Once used always wanted, and dealers say "Can't sell any other." Every Traveler should have a bottle of it.

Every Sufferer From Rheumatism, Sciatica, Neuralgia, Nervous Headache, Sore Throat, Cough, Catarrh, Bronchitis, Asthma, Cholera Morbus, Diarrhœa, Lameness, Soreness in Body or Limbs, Stiff Joints or Strains, will find in this old Anodyne relief and speedy cure. Pamphlet free. Sold everywhere. Price 35 cts., six $2.00. If you can't get it send to us. I. S. JOHNSON & CO., Boston, Mass.

A NATURAL FERTILIZER,

Canada Unleached Hard Wood ASHES.

Unequaled for seeding down and use with fall grain. Restores exhausted land. Especially valuable for fertilizing fruit trees. For Pamphlet, Sample, Price and any other information address

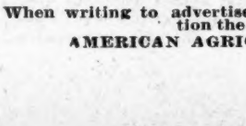
MUNROE, DeFOREST & CO., 62 Arcade Block, Oswego, N. Y.

8 PER CENT. WASHINGTON WARRANTS.

We offer City, County and State Warrants at par, drawing 8% interest. Delivered and collected free. Write for full particulars.

IMPERIAL LOAN & TRUST CO., Tacoma, Wash.

Davis STUMP Puller Lifts 20 to 50 Tons.



Old way

Worked by 2 men. 5 sizes. Price, $35 to $70. Circulars Free. Sent on Three Days' Trial. H. L. Bennett, Westerville, O.

SHORTHAND Writing *thoroughly taught* by mail or personally. Situations procured all pupils when competent. Send for circular. W. G. CHAFFEE, Oswego, N. Y.

Bookeeping, Penmanship and Spanish thoroughly taught.

When writing to advertisers, be sure to mention the AMERICAN AGRICULTURIST.

THE CROPS OF THE WORLD.

The Condition of The Crops.

The July crop report of the Department of Agriculture has been looked for with more than ordinary interest, partly owing to the low prices ruling for feedstuffs, partly to the short crops that have been expected, more especially of wheat, and partly to the drouth in Europe, which may cause a good demand, later in the season, for our corn and oats, as it has already done for our hay. The AMERICAN AGRICULTURIST supplements the bare statement issued by the Department with a comparison showing the status of this season's crops, July 1, in comparison with those of former years on the same date, thus rendering them more intelligible and of great interest to farmers.

The Corn Crop, according to the returns received by the Department of Agriculture, is grown, this year, on an acreage of 103.3 as compared with an area of 95.6 per cent. in 1892. This means an increase of rather more than 2,000,000 acres planted to corn, due in a very large measure to the bad weather early in the season, which prevented the successful early seeding of wheat and other crops, farmers being compelled later to utilize their land as best they could when the season had advanced. A comparison of the area planted to corn, this season and last, in the seven States of largest production gives an area of 105.3 this year as compared with only 89 in 1892, an increase of 16.3 per cent. this season. When we find that the condition of the corn crop, July 1, was also very much better than a year ago, this naturally looks like a largely increased harvest to be gathered, and farmers will naturally hope that the European feed crops will be such as to warrant a large export movement of corn from this country to foreign markets. The area planted in the seven largest producing States, this year and last, compares as follows: Ohio 99 as against 90 in 1892; Indiana 103 this year as against 84; Illinois 105 as against 84; Iowa 105 as against 87; Missouri 103 as against 86; Kansas 110 as against 99; Nebraska 112 as against 97.

It will be remembered that there was a decrease in the area planted to corn in 1892, in the seven States of principal production, as compared with 1891, but that there was a larger breadth sown in the cotton-growing States, the yield in the latter being also larger than in the former. This year's condition, however, shows a very heavy increase of the crop in the States that contribute supplies for market, an increase of 12.5 points as compared with a year ago, one point above the large crop of 1092 and two points more than the average of the previous six seasons. This year's average condition for the whole United States is given at 93.2 as against 81.1 in July, 1892, an increase of 12.1 points in favor of the present season, which has been a more favorable one for corn than for the wheat crop. An interesting comparison of the condition of the corn crop in this and preceding years on the same date, July 1, for the States of largest production, is given as follows:

States.	1893	1892	1891	1890	1889	1888	1887
Ohio	93	80	93	85	81	96	96
Indiana	96	72	95	94	81	95	98
Illinois	92	70	96	97	82	93	98
Iowa	98	75	94	95	95	89	99
Missouri	92	75	88	93	92	91	99
Kansas	93	81	82	93	97	99	100
Nebraska	94	84	90	91	98	91	100
Texas	89	95	95	90	98	95	82
Kentucky	90	93	95	87	90	97	91
Average	93	80.5	92	91.7	90.4	94	95.9

The Wheat Crop continues to show an assured shortage, as compared with the harvest of last year, there being a decrease of almost 12 points in the July condition this year, as compared with a year ago, and of 16.8 points in the condition of the spring wheat crop. Comparing further back with the large wheat harvest year of 1891, and this year's July condition shows a falling off of 18.5 points for winter wheat, and of an even 20 points in the spring wheat crop condition, as compared with two years ago. The condition of all wheat this year is 76.6, as compared with 90 last year, a decline of 13.4 points, of which 2.2 points fell off during the month of June. Were it not for the hitherto unparalleled surplus of wheat carried over into this season from last year, the decrease in the available supply for consumption and export during the 1893-94 season would be a very heavy one. But it appears that stocks throughout the world, on July 1st, were unprecedented, not only in this country, but were also larger than usual in Europe, afloat for Europe and in Australia. A comparison of the July averages of both winter and spring wheat, in the States of largest production, for this and the three previous years, full of interest to farmers at this juncture, when they have to decide upon selling or holding their wheat, and is given as follows:

WINTER WHEAT, JULY CONDITION.

States.	1893	1892	1891	1890
Pennsylvania	94	92	98	95
Kentucky	92	97	96	78
Ohio	93	83	97	82
Michigan	79	88	89	75
Indiana	83	85	99	67
Illinois	66	90	98	66
Missouri	77	84	98	74
Kansas	46	91	94	82
California	88	95	98	87
Oregon	96	91	94	82

SPRING WHEAT, JULY CONDITION.

Minnesota	77	92	93	98
Iowa	95	88	96	95
Nebraska	68	82	96	88
South Dakota	69	95	97	94
North Dakota	73	90	98	94
Washington	91	90	77	93
Averages	74.1	90.9	94.1	94.4

The Cotton Crop declined almost three points in its condition during June, standing at 82.7 on July 1st, as compared with 85.6 on June 1st. Reports show the general prevalence of bad weather, cool nights, excessive rains in most sections, but occasional spots that suffered from drouth. There has also been considerable injury done to the crop by lice and other insects, so that indications at the beginning of last month were not favorable for a larger crop than that of the 1892-93 season, even allowing for the slightly increased area. Comparisons of the June and July conditions this and last years, with the July condition of former years, are given as follows:

States.	1893.		1892.		*July.*			
	July.	*June.*	*July.*	*June.*	1891.	1890.	1889.	1888.
Virginia	98	95	85	79	82	92	83	81
North Carolina	81	83	91	88	77	95	85	85
South Carolina	83	88	94	91	80	95	84	86
Georgia	86	87	88	87	85	95	86	90
Florida	96	98	86	89	94	91	90	90
Alabama	80	82	90	91	87	95	87	92
Mississippi	80	86	85	91	91	89	91	92
Louisiana	84	87	84	82	90	86	92	91
Texas	84	82	87	81	95	89	90	76
Arkansas	80	89	77	75	93	89	83	90
Tennessee	85	92	87	90	82	93	82	90
Average	82.7	85.6	86.9	85.9	88.6	91.4	87.6	86.7

The Oat Crop fell off one point in condition during June, standing at 88.8 on July 1st, as compared with 89.9 the previous month. This season the condition of oats is higher than in any year since 1889, when it stood at 94.1, declining to 81.6 in 1890, advancing to 87.6 in 1891, and falling off to 87.2 in 1892. This year's July condition is precisely the same as that in 1888, and it will be remembered that last season, when conditions were reported 1.6 lower, there was unfavorable weather during seeding time, followed by too much rain during the period of growth.

The Outlook for Rye improved somewhat during June, from a condition of 84.6 on June 1 to 85.3 on July 1, as compared with an average of 92.8 in July, 1892, which was somewhat below the 1891 condition. Winter rye stood at 83.8 last month, as compared with 92.9 a year ago, and spring rye condition was 89, as against 92.7 last year.

The Barley Crop, like that of oats and rye, made very little change in its condition during the month of June, the average being but .5 higher and standing at 88.8 on July 1, as compared with 92 a year ago, which was the highest July reported in any year since 1885. Earlier in the season the barley crop was affected by the cold and backward spring, with drouth in some sections, and too much moisture in others.

The Potato Crop of 1893 is reported as being planted on an area 101.1 per cent. of that of 1892 when the acreage was given at 94.2 per cent. of the large breadth planted in 1891. This year's condition of the potato crop, July 1, was but little higher than the 90 condition of a year ago, which was a very low one, the previous lowest July condition being 91.7 in 1890. Colorado beetles are reported as doing considerable injury to the crop, more especially in the central West. This crop is subject to more vicissitudes after July 1, but, as far as the reports then indicated, there are not likely to be many more potatoes this year than last season.

The Clover Crop had an average condition of 93 for the country, as compared with 95.5 on July 1, 1892, and 89.3 in 1891. Timothy is short, however, this year's condition being given at 89.8 as compared with 96.8 a year ago, and 87.4 in July, 1891. The 1892 condition was an unusually high one for the whole country, many States showing absolutely perfect condition. Pastures, this year, were reported to be in good shape with an average condition of 94, but this is hardly as good as the 98.4 in 1892, when pastures were, like timothy, almost perfect.

The Tobacco Crop is reported as sown on an area 98.6 per cent of that of 1892, when it was 97.3 per cent. of the 1891 acreage. Last year, it will be remembered that there was a decrease in the area of the shipping districts, but a considerable increase in the acreage planted to seedleaf, and the area this year is about unchanged, though perhaps with a slight falling off in the seedleaf area. The condition of the crop, July 1, is given at 93 as compared with 92.7 a year ago, both these conditions being higher than the July returns of years previous to 1892.

The Hay Crop of the United States is attracting so much attention that Secretary Morton, of the Department of Agriculture, has received many requests from abroad, both direct, through United States consuls abroad and through the foreign legations at Washington, for information as to its extent and quality, also seeking knowledge concerning our other forage crops. All these communications emphasize the shortage in the hay and forage crops of Europe, and more especially in France, and the Department believes there will be a large foreign demand at remunerative prices for baled hay, which has been selling in England at $45 and $50 per ton. The report says that at present prices in this country there can be little question but that a shipment of baled hay to Great Britain and France would be a profitable venture this season. The shortage of hay and forage crops in France has reached such a point that many cattle have been slaughtered, and it would, therefore, seem probable that the conditions now existing on the Continent of Europe will result in an increased demand for American meats in the near future, in addition to the present demand for American hay.

Pears Rotting at the Core.—G. A. Bush, N. Y.: Certain varieties of the pear have the very bad habit of rotting at the core before showing signs of ripening on the outside. The only practical remedy or preventive is to gather the fruit as soon as it is fully mature and ripen it in the house. Just as soon as a few specimens on a tree turn yellow and show that the ripening season is at hand, the entire crop should be gathered and placed in a cool cellar or fruit-house, where the ripening process can continue less rapidly than if all were left on the tree. When the fruit will part freely from fruit-spurs, without breaking either stem or spur, it is ready for gathering, and if taken at this time and stored in a dark, cool place until ripe, the flavor will be greatly improved, and the decay at the core usually prevented. We do not know of anything that you can apply to the soil to prevent the disease of which you complain.

Remedy for Black Ants.—F. J. Merry, Montgomery Co., Ohio, desires to know the cheapest and best way of killing the big black ants that trouble his garden. There does not appear to be a sovereign remedy against these garden pests. An experienced gardener on Long Island informs us that he scatters air-slaked lime over the ground where they appear, until it is quite white. This has proved perfectly satisfactory in his case.

Wants to be Taken Back.—I have not seen the AMERICAN AGRICULTURIST for several years, but the sample copy just received makes me wish to be taken back into the family again. It looks well, and the pages are more full of useful information than ever.

A. J. GRIFFIN, Summit Co., Ohio.

The St. Regis Indians.

Splendidly formed, bright faced, dark eyed Indian maidens, lissome and active, hoeing and working in the fields—such is a not uncommon sight in the St. Regis Reservation. An interesting people it is who live there, right on the boundary line between New York State and the Province of Quebec. Just where the national boundary line is, however, it would be difficult to tell, although in the very heart of St. Regis village there is an iron post, with the inscription: "Boundary, August 9th, 1842. Treaty of Washington. Albert Smith, U. S. Comssr. Lt. Col. I. B. B. Estcourt, H. B. M. Comssr." But this post is not in its original position, having been willfully misplaced, years since, while some others of the iron row set up to mark the line have been destroyed. There is a little grocery store and hotel kept by one of the three white men in the village, the other two men being the French priest and the Canadian Indian agent. When visitors drive over from the nearest United States town, or come down the river from Cornwall, they seldom remain more than an hour or two. We, however, stayed there for several days, and felt excellently well repaid.

The international boundary line passes right through the hotel—although no one can tell through just which part of the building—and we might waken in the night and fancy that our heads were over in Canada while our feet were in the United States, or we might, at dinner, realize that while our beefsteak might be subject to the Queeen, our coffee perhaps owed allegiance to the President. The fact that there is no exactly known boundary line seems to make no difference to the good looking, industrious, well disposed people who live in the village and the district adjoining. There are no law officers on either the American or Canadian portions, although the combined population of the two adjoining reservations is some 2,500 people.

In the village itself, a straggling town built up where the St. Regis River enters the St. Lawrence, the principal industries are la crosse stick making, fishing, and, more than all, basket making. And the skill of some of the basket makers is most remarkable. Within the village there is some little vegetable gardening carried on, and outside of the village limits there is quite an amount of regular farming. The farms, however, are not, as a rule, well kept. There are too many weeds allowed to grow. There is scarcely any effort to check the spread of Canada thistles. Mustard plant is much too plentiful, and yet it would be unjust to altogether blame the Indians for this. The reservation life and restrictions seriously check individual endeavor, without supplying sufficient benefits in return. The Indians are unable to purchase enough good farming implements and machinery to cultivate and work the ground thoroughly, and yet they must go into the market with their products against well equipped white farmers. A small proportion, indeed, are fairly well supplied with machinery, but the majority cannot well compete with the whites, and the natural results are inferior products, inferior prices, and the chilling of hearty endeavor.

The St. Regis Indian farmers, as a class, are a comfortable looking set of people, and it is curious to go into their homes and find still in use the tickewagun, the type of cradle used by the Indians, with some tribal variations of design, from time immemorial. It is a flat piece of board, upon which the baby is tightly bound, there being a rest for the feet, and a hoop-like curved piece extending out from near the top. Upon this hoop little trinkets are suspended, and the baby plays with them. Should it become restive or cross, the only punishment is to take away the trinkets and bind the child's arms down with the rest of the tightly swathed body. Indians never whip or beat their children—a mode of "savagery" from which civilized parents might learn a little humanity.

Anciently, it was customary to often suspend the tickewagun from the branch of a tree, and it is to this that the old rhyme refers: "Rock-a-bye, baby, on the tree top." The usual way among the St. Regis Indians is to place the board, in an almost vertical position, against the wall of the room or some similar support. Even when these children have grown to maturity, and gone forth to make new homes of their own, adopting the methods of living more in accordance with our ideas of civilization, the quaint, rude cradle of their childhood is often lovingly preserved in some corner.

A Man's Success In Life.

Mr. A. Eby, of Detroit, Attributes It to a Singular Cause.

HE WAS DYING OF TORTURE AND TOOK ADVICE.

A STORY ALMOST ROMANTICALLY MARVELOUS.

(From the Detroit Free Press.)

He was a sturdy old gentleman. The fine lines of thought which furrowed his brow gave to his face that appearance which suggested the student who pores o'er the misty old tomes of antiquity, rather than the hard-working blacksmith that he is. But he possesses an intellectual face. He is that picture of health artists go into ecstasies about. It must have been such a subject as he that inspired the great Longfellow to give to the world the immortal "Village Blacksmith."

The gentleman referred to is Mr. Aaron Eby, of Detroit. At 7 and 9 Middle street, Mr. Eby runs a carriage factory in partnership with W. D. Rumsey. Yesterday morning the old gentleman was busily engaged at the bench when seen by the writer. He is a blacksmith of over thirty-five years' experience, and was formally engaged in carriage building at Flint, Mich. He has held the position of foreman blacksmith in some of the largest carriage and wagon factories in this state.

Mr. Eby was born in Waterloo County, Can., about 56 years ago. He is very well preserved for a man of his age. His full black beard is only streaked with a slight tinge of gray.

When about 22 years of age he moved to Michigan. His first home was in Genesee County, then he moved to Livingston County, and finally to Ionia. Then he came to Detroit. His success since he came here has been flattering.

"But what do you suppose it may be attributed to?" asked the old gentleman.

"Good work and good treatment of your customers," was suggested.

"Well, in a measure, yes," he replied, "but my success in life depends largely upon two boxes of Dr. Williams' Pink Pills for Pale People. Don't smile at this assertion, and set it down as an absurdity. It is the truest fact that was ever stated by man. You see me to-day. I am over 50 years of age, and I feel as young as I did twenty years ago. I am strong, healthy, and good enough to last another half century.

"Five years ago," he continued' "I had an attack of rheumatism, and I suffered tortures enough to kill any average man. It was due, I suppose, to the fact that I was exposed so much to cold, heat and draughts in the workshop. I do not know of any place where a man is so liable to suffer the discomforts of a tropical summer and a frigid winter as in a blacksmith shop. If it were not for the fact that our trade hardens the constitution I believe that a smith would be very short lived. But that attack of rheumatism completely knocked me out.

I worked, however, day in and day out, and circumstances many times compelled me to forget my torture. The pain settled in the small of my back. You may talk of agony, but when it comes to an able-bodied attack of rheumatism, no other form of torture can equal it. It plays with the tenderest sentiments of your soul. It breaks every bond of pity and charity that nature should have for you. It applies the screws of combined evil to make life hateful. In short, the agony of rheumatism is the double-distilled essence of misery. Great heavens, when I think of the sufferings that I endured it seems marvelous that I am now alive. When my constitution was about wrecked with these pangs of the torture it appeared as though the pain would cease for a time. But it would start up again with renewed energy. Cold or damp weather brought on an attack. A thunderstorm invariably prostrated me. Why, man alive, I would be so bad sometime that I could scarcely move. I could not stoop. I could not turn in the bed in which I was compelled to stop. I was helpless and most unfortunate. In this condition I had recourse to almost every patent medicine that I ever heard of. There was no relief. Then someone suggested that I try the hot water cure. I did so, but it did not alter my condition. Another kind friend induced me to take a course of electric baths, with the same results. Finally I had reached such a stage that I had given up all hope of ever securing any relief. I was in bed with a fearful attack just before Christmas, and was suffering awful torture. My partner, Mr. Rumsey, called to see me, and he sympathized with my condition. "Why," he asked, "don't you get a box of Dr. Williams' Pink Pills and be cured?" I laughed at his suggestion. 'Why,' I responded 'I have tried almost every medicine and have found them all the same.' He informed me that he had used the pills in his own family with remarkable results. Well, here was a case that appealed to me. A drowning man never grasped at a straw with the hopes that I grasped Mr. Rumsey's advice. I sent immediately to A. A. Brown & Co.'s drug store, corner of Woodward and Congress streets, and purchased a fifty-cent box of the pills. I promptly tested the curative powers of the little pellets. The effects were simply marvelous. By the time I had used one-quarter of the boxful I was out of bed, and when I had taken all the pills I was able to be around. I purchased another box and continued taking them, and astonishing to relate, I was able to be at work when I had used scarcely half of the second box. The rheumatism in my back and legs left me. I am now as strong and healthy as I ever was, and I attribute it all to Dr. Williams' Pink Pills. It may seem singular to you, but my story will bear out my assertion that a great part of my success in life is due to this marvelous medicine."

Dr. Williams' Pink Pills are not a patent medicine in the sense in which that term is usually understood, but are a scientific preparation, successfully used in general practice for many years before being offered to the public generally. They contain in a condensed form all the elements necessary to give new life and richness to the blood, and restore shattered nerves. They are an unfailing specific for such diseases as locomotor ataxia, partial paralysis, St. Vitus' dance, sciatica, neuralgia, rheumatism, nervous headache, the after affects of the grippe, palpitation of the heart, pale and sallow complexions, that tired feeling resulting from nervous prostration; all diseases depending upon vitiated humors in the blood, such as scrofula, chronic erysipelas, etc. They are also a specific for troubles peculiar to females, such as suppressions, irregularities, and all forms of weakness. They build up the blood and restore the glow of health to pale or sallow cheeks. In the case of men they effect a radical cure in all cases arising from mental worry, overwork or excesses of whatever nature.

They are manufactured by the Dr. Williams' Medicine Company, Schenectady, N. Y., and Brockville, Ont., and are sold only in boxes bearing the firm's trade mark and wrapper, at 50 cents a box or six boxes for $2.50. Bear in mind that Dr. Williams' Pink Pills are never sold in bulk or by the dozen or hundred, and any dealer who offers substitutes in this form is trying to defraud you and should be avoided. Dr. Williams' Pink Pills may be had of all druggists or direct by mail from Dr. Williams' Medicine Company from either address. The price at which these pills are sold makes a course of treatment comparatively inexpensive as compared with other remedies or medical treatment.

RUPTURE A positive radical cure at home. (Sealed) Book giving full particulars sent FREE. Address. DR. W. S. RICE, Box 444 Smithville, Jefferson Co. N.Y.

DROPSY TREATED FREE Positively CURED with Vegetable Remedies. Have cured many thousand cases called hopeless. From first dose symptoms rapidly disappear, and in ten days at least two-thirds of all symptoms are removed. BOOK of testimonials of miraculous cures sent FREE. 10 DAYS TREATMENT FREE by mail. DR. H. H. GREEN & SONS, Specialists, ATLANTA, GA.

BOOKS FOR FARMERS!

STOCK BREEDERS, GARDENERS, FLORISTS, FRUIT GROWERS,

And all others interested in **Rural Life.** We supply any book published on the above subjects. **CATALOGUE of 600** standard works **sent free.**

ORANGE JUDD CO., New York.

THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST

MATTERS OF BUSINESS.

The Agricultural Outlook in Florida.

Florida is not on a boom, but it is making sure and steady progress. There seems to be even less demand for labor, especially white labor, than there was only a few years ago. Here and there a few acres are being cleared and planted to trees, or vines, or pineapples, or vegetables; no great number of people are coming here from other States to locate. The timid and disheartened have been winnowed out by occasional freezes, and frosts, and hard times, and the State is getting into shape for solid progress. Many of those who came here so full of wisdom that they thought to revolutionize affairs and make speedy fortunes, have left in disgust. The great present trouble is that the experience in one locality is often diverse from that of another, with conditions apparently similar.

The night air here is so humid and the dews are so heavy that drouths, such as afflict other parts of the world, are unknown here. Yet it is impossible to secure the best results without irrigation, and the demand for irrigating plants is steadily and rapidly increasing. The present indications are that it will be but a few years before every intelligent cultivator of the soil will provide good irrigating facilities before attempting to grow crops to any extent.

The tendency is strongly to concentration of effort on small plats highly fertilized, well watered, with most thorough tilth and preparation of the ground. Careless, slipshod, shiftless cultivators seem to fare worse here than in any other section of our country. The soil does not respond to ignorant, half-hearted attempts to grow something, while nowhere does intelligent industry, aided by sufficient means, secure more ample, generous and satisfactory returns. The profitable growing of oranges and other citrus fruits is being more and more recognized as a matter of intelligent business, and not of luck; the grape industry is getting on a firm basis, while a large variety of other fruits is being grown in comparatively small quantities. In South Florida, especially on the east coast, the growing of pineapples, bananas and cocoanuts is assuming increasing and encouraging proportions. A great need is the establishment of manufacturies of various kinds, and they are sure to come when the opportunities afforded are properly understood.

SHERMAN ADAMS, Orange Co., Fla.

Personal, Commercial and Agricultural.

A Salary, with expenses paid, will come handy to any one who is now out of employment, especially where no previous experience is required to get the position. If you want a position, see advertisement on page 487, headed "A Chance to Make Money."

Well Machinery.—The American Well Works at Aurora, Ill., manufacture a complete line of well machinery for driven and bored wells, and also pumping engines and pumps of every description. Write them for illustrated circulars, which are sent free to our readers.

Setting Wagon Tires With Oil.—A cast-iron trough to hold hot linseed oil, with which to set the tire and protect the felly by a thorough soaking, is made by C. O. Bartlett, Cleveland, Ohio. Write him a postal for free descriptive circular, mentioning this magazine.

Hay in Great Britain.—Our latest advices from Thomas Irvine & Co., of Liverpool, indicate that hay has shown a slight improvement in price in Great Britain. Fine weather still continues there, and, as already intimated, the crop will certainly be a small one. American hay sold at $22.50 to $25 per ton, according to quality.

Coach and Carriage Horses in Demand.—The Smith & Powell Co., Lakeside Stock Farm, Syracuse, N. Y., report that they are having an unusual demand this season for matched coach horses and carriage horses, of which they have sold a large number in New York, Boston, and other large cities. They have made quite a specialty of matched horses, and have a wide reputation for this class.

Information About Silage.—As silage and fodder cutting form a prominent study among farmers everywhere, the views of practical men upon the subject are certainly of great value. A 72-page illustrated catalogue is published by the old and reliable manufacturer, Minard Harder, Cobbleskill, N. Y., who has made a special study of the subject, with a view of supplying all necessary information in regard to silos and the best machinery for the cutting of the silage. It will be sent free by Mr. Harder, as above, to all who apply and mention the AMERICAN AGRICULTURIST.

Errors in School Books.—The Pope Mfg. Co., of Boston Mass., offer one of their best pneumatic-tired Columbia Safeties, 1893 pattern, worth $150 to each of the five persons who shall send them the greatest number of errors in some text-book in the English language which are susceptible of being proved to be errors of statement. Write the Company for particulars, addressing Educational Department.

The People's Knitting Machine.—There is a great demand for a cheap, practical knitting machine, adapted to the requirements of American households. Such a machine is made by J. E. Gearhart, at Clearfield, Penn. It will knit a stocking complete, with heel and toe, in ten minutes, and is adjustable to all grades of work, using coarse woolen yarn down to the finest cotton threads. It will also knit a thread of cotton and silk together, which makes a very fine grade of work. All the fancy stitches and designs can be made, and all household fabrics and garments knitted.

Crimped Roofing and Siding.—Crimped iron, applied on sheeting boards and also direct to rafters, is becoming very popular for roofing and siding saw mills, barns, and all such structures where parties do not care to expend much money for construction. It is manufactured by the Garry Iron and Steel Roofing Co., of Cleveland, Ohio, from No. 27 to 18 gauge of both painted and galvanized iron, in sheets eight feet long, or ten if desired, and which lay 24 inches wide from center to center of crimp. It is very easily applied. Any ordinary mechanic can lay from eight to ten squares per day.

Potash at Chicago.—Among the agricultural exhibits at the World's Fair, one of the most interesting is that of the German Kali Works, 93 99 Nassau street, New York city, in which the products of the great potash mines are displayed. These mines are located at Stassfurt, Germany, and furnish, as is well known, a large supply of potash, a valuable plant food and ingredient of complete fertilizers. The potash coming from this source is found in large quantities, in the form of solid masses of potash salt, most of which are subjected to a manufacturing process, by which they are concentrated and made ready for use. The exhibit comprises a full collection of these minerals, which are highly interesting to the geologist and agricultural student.

Pure White Lead Tinting Colors.—Mr. S. H. Conklin writes from Mt. Carmel, Conn.: "Enclosed please find check for your bills of May 2d and 12th. I repeat the gratification I expresed

(*Continued on Page* 487.)

THE

Owen Electric Belt

AND APPLIANCES

FOR MEN AND WOMEN

CURE MANY DISEASES WHEN ALL OTHER REMEDIES FAIL. GET ONE.

(TRADE MARK.)
DR. A. OWEN.

TONE UP THE SYSTEM AND RESTORE LOST VIGOR. TRY ONE.

A GENUINE CURRENT OF ELECTRICITY

Is generated in a battery on the belt, and can be applied to any part of the body. The current can be made mild or strong, as the case may require, and is absolutely under control of the wearer at all times.

OUR ILLUSTRATED CATALOGUE

Contains fullest information regarding the cure of Acute, Chronic and Nervous Diseases, Sworn Testimonials, with portraits of people who have been cured. Price List, and Cuts of Belts and Appliances, and how to order, published in English, German, Swedish and Norwegian Languages. This catalogue will be mailed free to any address on receipt of six cents postage.

The Owen Electric Belt and Appliance Co.,
MAIN OFFICE AND ONLY FACTORY,
THE OWEN ELECTRIC BELT BLDG.,
201 to 211 STATE ST., CHICAGO, ILL.

The Largest Electric Belt Establishment in the World.

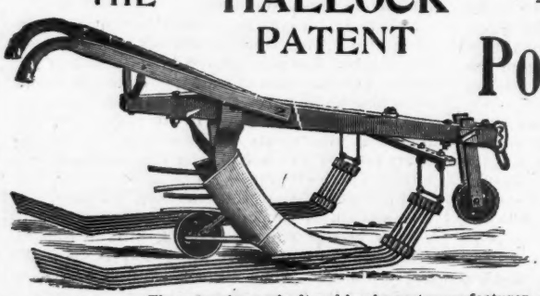
When visiting the World's Fair do not fail to see Dr. A. Owen's exhibit, Electricity Building, Section U, Space 1.

When Writing Mention this Paper.

POT-GROWN STRAWBERRIES Now is the Time to Plant to Secure a Crop next Season.

Handsome Catalogue of the **Best** varieties (old and new); also list of **Holland Bulbs** and **Specialties** for **Fall Planting,** mailed free on application. **ELLWANGER & BARRY,** Mount Hope Nurseries, ROCHESTER, N. Y.

THE HALLOCK PATENT IMPROVED **Potato Digger.**



THE BEST DIGGER ON EARTH,
REGARDLESS OF COST.

AGENTS WANTED.

The extensive agricultural implement manufacturer, A. B. FARQUHAR, of York, Pa., says: **"All things considered, it is the best Potato Digger in the U. S."**

Write for Descriptive Catalogue and testimonials to **H. W. DOUGHTEN,** SOLE MANUFACTURER, MOORESTOWN, BURLINGTON CO., N. J.

NO MONEY PAYMENT TO BUY A FARM!
Best terms ever offered.
I will send free the new paper called the Western Settler. It tells all about it.
Address JOHN SEBASTIAN, Gen. Ticket and Passenger Agent, Chicago, Rock Island and Pacific Railroad, Chicago, Ill.

AGENTS $50 to $100 A WEEK.
Ladies or Gents. Best seller known. Needed at every house, place of business or farm the year round. "Home" Electric Motor runs all kinds of light machinery. Cheapest power on earth. Connected instantly to wash or sewing machine, corn sheller, pumps, fans, lathes, jewelers' or dentists' machinery, &c. Clean, Noiseless, lasts a life-time. No experience needed. To show in operation means a sale. Guaranteed. Profits immense. Circulars free.
W. C. HARRISON & CO., Columbus, O.

WALL PAPER The select colorings and designs of the season. 100 samples for 8 cents.
A. L. DIAMENT & Co., 1624 Chestnut Street, Philadelphia.

When writing to advertisers be sure to mention the
AMERICAN AGRICULTURIST.

MATTERS OF BUSINESS.

(*Continued from Page* 486.)

before as to the convenience, the economy, and the real artistic beauty the National Lead Company's Pure White Lead Tinting Colors have proved to me in using them. It would seem as if the old way of trying to produce the desired shade of color by mixing many colors together, with much labor and guess-work, must be abandoned in favor of your economical, sure and easy method. My painters wish to introduce their use in an adjoining town, and want a couple of your books as guides."

Grand Prizes for Hay Presses.—An official cable message received from Milan, Italy, where the Grand International Field Trials of Hay Presses have just closed, informs the Whitman Agricultural Co., St. Louis, Mo., that they have been awarded the Object of Art for Power Baling Presses, and the Grand Gold Medal for Full Circle Steel Baling Presses. This recognition duplicates the decisive awards made at the Paris Exposition and Field Trials in 1889. The above awards are especially valuable in showing pronounced superiority, as the tests imposed were severely exhaustive, and were participated in by prominent manufacturers in the United States and Europe. The fact that the Whitman presses received the principal prizes speaks eloquently of preëminent qualities.

Raspberry Rust.—Francis L. Carey, Genesee Co., N. Y.: The rust of the ordinary red raspberry attacks the young canes, and appears in the form of white or grayish, flattened, depressed spots bordered by a ring of dark purple. But the black raspberries are attacked by a reddish rust covering the leaves so thickly that it readily rubs off upon a person's clothes while passing in among the plants. This red rust also attacks the blackberry and is very destructive. Unfortunately, we have no certain remedy or preventive to suggest for either disease, further than to dig up and burn all diseased plants and set out new and healthy ones on fresh or new lands where raspberries have not been grown for several years at least. Perhaps spraying with Bordeaux mixture, or other now well-known fungicides might destroy these rusts, but this can only be determined by giving them a trial in the field.

A Lightning Express.—The latest development in railroading has been the addition of "The Empire State Express" to the regular service of the New York Central & Hudson River Railroad. This is claimed to be the fastest train in the world, making the distance between New York and Buffalo in eight hours and forty minutes. Of course all the equipment is of the most elegant description, and the journey is made with perfect comfort and safety, owing to the excellence of the Central's roadbed and rolling stock. Among busy men to whom time is money, such a "flyer" as this express will be very popular. Still, it is only one of twelve splendidly equipped trains that traverse New York State daily by this admirable service. There is no more swift or pleasant way of getting East or West than over this route; in fact, we might vary the old maxim and say, "East or West, Central's best."—*The Dry Goods Economist.*

Honeybees and Chestnuts.—Mrs. J. C., Rockland Co., N. Y.: Do honeybees gather honey from the flowers of the chestnut? We are inclined to think neither the staminate nor the pistillate flowers of this tree yield any honey. We have frequently noticed the swarming of the bees about chestnut trees early in the morning, but attributed their visits to the abundance of honeydew smeared over and dripping from the leaves, which the bees seemed to be gathering, but just as soon as the sun dried up this substance the bees departed, which they would not be very likely to do if they found any sweets in the flowers. Bees may, in some instances, collect the pollen from the staminate flowers, but beyond this, it is very doubtful if either sex of chestnut flowers possess anything to attract the honeybee. Plant lice have been very numerous this season; consequently honeydew has been very abundant.

Southdown Sheep in England.—The Southdown Sheep Breeders' Association of England has issued the second volume of their Flock Book. This contains the pedigrees of 506 rams and 89 ewes, with indexes of animals named in both volumes, also an index of owners and list of members. The publication of this volume so soon after the first volume and the gain of two-thirds in added membership, indicates that English Southdown Breeders have awakened to the importance and necessity of recording their sheep. In addition to the registry of their stock, this Association further advances the interests of this breed of sheep by sales from the flocks of its members under its direct supervision. American buyers desiring animals from the home of this breed will be glad of the success attending this Association, and to know that by dealing with its members they may procure sheep of guaranteed purity and correct pedigree, and also by tattoo marks of the Association be assured of the identity of the animal they purchase.

Johnson Grass For Pasture.—E. W. Campbell, Tarrant Co., Tex.: The so-called Johnson or Mean's Grass, (*Sorghum halepense*) is a rank growing perennial, with large subterranean stems or roots which spread widely and rapidly through the soil. When once established in rich soils, it is very difficult to eradicate, and many Southern planters denounce it on this account. Cattle, horses and sheep are very fond of the fresh leaves and stalks, and hogs like no better pastime than boring the earth for the roots. It makes a good pasture grass in warm climates, provided it is kept cropped close enough to prevent it from running up to seed, for when the stalks mature, they are rather hard and woody. If cut early it makes very good fodder, but requires considerable care in the curing, owing to the succulent nature of the leaves and stalks. The best way to get a good stand of plants is to plant pieces of roots, dropping them in shallow furrows opened with a plow, but seeds may be sown at the rate of a half bushel per acre, either broadcast or in shallow drills.

The University Settlement, of New York City, appeals for flowers and plants for the tenement houses, for the sick, poor and unfortunate; for homes where sunlight seldom or never enters, and which need the gladness flowers bring; for children who only know enough of flowers to beg piteously for them, and to wait patiently for hours before the door, hoping for the flowers they are too often unable to get. There are too many disappointed faces, and too few bright and happy ones. We hope that sometime there shall be at least one plant to brighten every tenement home, and one flower to gladden the heart of every child in that district. Will not the readers of the AMERICAN AGRICULTURIST help us to accomplish this? Send plants or flowers, as many and as often as possible. Boxes under twenty pounds in weight addressed to the University Settlement, 26 Delancey Street, New York, will be delivered express free, at any time, by all express companies entering New York. To avoid trouble with local agents, mark parcels "Collect in New York," and it will be arranged with the express companies. Contributions of money are also necessary to carry on this work, and would be most thankfully received.

Potato Digging Contest.—There was quite a large number of prominent farmers present at the potato digging contest held on the McCurdy Model Farm, New Brunswick, N. J. The contest began at 2 o'clock. The little Hallock got to work as the prime favorite. The Improved Hallock is simple in construction, perfect in operation, very light draft, and its low cost puts it within the reach of all. The work done was clean, and the digger following it returned after the row had been dug, with about two quarts of tubers, as against a half-bushel left buried by the others. Among the gentlemen present were noticed Senator Rue of Trenton; Warren J. Crosby of Norfolk, Va.; Prof. Smith, Prof. Voorhees, Mr. Sears of the State Experiment Station, and several from Philadelphia and the interior of the State, also Prof. E. W. McGann of the State Weather Service. The machines exhibited all did good work. The trial was made at the suggestion of W. J. McCurdy, who was undecided as to which machine to buy for his farm, on which he has 13 acres of very fine potatoes, and his fields of corn and other cereals are the finest in this section. At the conclusion of the competition a vote was taken as to which machine did the most satisfactory work. The vote stood 19 ballots, Improved Hallock, made by H. W. Doughten, Moorestown, N. J. Mr. McCurdy got the Improved Hallock, and orders for ten more were taken.

Water for Every Farm.—The first essential article is usually at hand—a good well, spring, or pond. The second necessity is a De Lamater Rider or De Lamater Ericsson Hot-Air Pumping Engine. With one of these engines a farmer can water his stock, sprinkle his lawn, irrigate his crops, have running water in every part of his house as well as his barn, and, to crown all, save his home from destruction by fire when threatened. The saving of time and labor by having running water wherever needed, in the stable or the house, on the lawn or in the garden, is very great; while the luxury of the conveniences thus secured can be obtained at comparatively small cost. The De Lamater Rider and De Lamater Ericsson Hot-Air Pumping Engines are specially designed for pumping water. Untiring energy and ingenuity has completely solved the question of domestic water supply, especially as applied to the occupants of farms. These engines will pump water from shallow streams or the deepest wells, either dug, driven or artesian. No labor is required and no time lost. They are extremely simple, and can be operated by ordinary farm help; are absolutely safe, require no steam, have no valves, and are practically noiseless. They do not affect insurance. Fuel is an important consideration, and a prominent feature of these engines is the fact that they require but little heat to operate them, and almost any kind of fuel will furnish the necessary amount of heat to drive them to their utmost capacity. Catalogues may be obtained by writing to the manufacturers, the De Lamater Iron Works, 87 South Fifth Avenue, New York.

Would Rather Be Without Breakfast Than The American Agriculturist.—I have been a constant reader of the AMERICAN AGRICULTURIST for the last ten years and I would rather be without my breakfast than without the AMERICAN AGRICULTURIST. I am particularly pleased with the articles on raising flowers.

MRS. WM. THOMAS, Cook Co., Wy.

HARTSHORN'S SELF-ACTING SHADE ROLLERS

Beware of Imitations. NOTICE AUTOGRAPH OF Stewart Hartshorn ON LABEL AND GET THE GENUINE HARTSHORN

THE GREAT AMERICAN TEA COMPANY

GOOD NEWS To Ladies, Boys and Girls.

Gold and Silver Watches FREE. Beautiful Imported Decorated China Tea and Dinner Sets, Toilet Sets, Lamps, Castors, Silver Butter, Fruit and Cake Dishes, Silver Tea Sets, Knives, Forks, Cr... ons, Webster's International Dictionaries, etc., Given Free with $12, $15, $20, $25, $30, $40 orders. For full particulars, address THE GREAT AMERICAN TEA CO., P. O. Box 289. 31 and 33 Vesey St., New York.

"LISTEN TO THE" tale of **FLORIDA** Profit and loss. Advantages and drawbacks in our monthly "Florida Homeseeker," telling of an ideal township and climate. High, healthful land. Freedom from Frosts, Swamps and Malaria, 25 clear lakes. Cheap homes sold on $1.00 (and up) per month installments. Cheap transportation to settlers and prospectus. Cheap and good Hotel board. Free boating, etc. Oranges, Lemons and Pineapples our Staples. Summer is here delightful. No negroes, no liquor Sample paper free. Hundreds buying. Write now. O. M. CROSBY, Editor, Avon Park, Fla.

Pineapple and Farming Lands,

New Section of Country.

The Indian River, Lake Worth, and Biscayne Bay Country, on the East Coast of Florida,

Is now being opened up by the construction of a new railroad, and by the improvement and connection of the rivers along the coast, making a continuous waterway for steamboat navigation of 326 miles in length.

These two new transportation lines will give this section unexcelled shipping facilities, and the climate is unsurpassed. The Florida Coast Line, Canal and Transportation Company owns large bodies of land along the East Coast, which will have the full benefit of this new transportation.

This land is now offered for sale.

For full information apply to the offices of **The Canal Company, St. Augustine, Florida.**

VIRGINIA,

ALBEMARLE COUNTY,

The great fruit, grain and stock-raising section of the State. Winters mild and short. Scenery beautiful. Health fine. Near the great markets. Educational advantages unsurpassed.

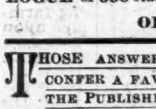
Land Good! Prices Cheap! Taxes Low!

Farms and City property for sale. Write to SAM'L B. WOODS, Charlottesville, Va.

To Mushroom Growers: Those intending to try this new **money making** crop the coming fall and winter will hear of something to their advantage by addressing the undersigned. Send postal for circular **at once.** G. C. WATSON, Wholesale Seedman and Commission Merchant, 1025 Arch Street, Philadelphia, Pa.

A CHANCE TO MAKE MONEY. Salary and Expenses paid, or commission if preferred. Salesmen wanted. No experience needed. Address, stating age, THE C. L. VAN DUSEN NURSERY CO., Geneva, N. Y.

THE "HANDY" TRADE MARK



WANTED agents everywhere to sell our Stove Polishing Mitten and Dauber. Big Pay. Every lady wants one. It keeps her hands perfectly clean and produces better Polish than a brush or rag. Sample set, 35c. Address, Handy Mitten Mfg. Co., 335 A Washington St., Boston, Mass.

BOOKS FOR FARMERS!

STOCK BREEDERS, GARDENERS,

FLORISTS FRUIT GROWERS,

And all others interested in **Rural Life.** We supply any book published on the above subjects. CATALOGUE of 600 standard works Sent Free.

ORANGE JUDD CO., New York.

THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

State, County and Other Fairs in 1893.

PREPARED EXPRESSLY FOR THE AMERICAN AGRICULTURIST.

[*Copyright by the Orange Judd Co.—Other periodicals will give credit when copying this list.*]

To Our Readers.

If your County or District Fair does not appear in the list below, kindly request the Secretary of the Society to forward to us the name of the place where, and the date when, it is to be held. We desire a complete list of fairs in the United States and Canada to appear in the September number of the AMERICAN AGRICULTURIST.

STATE AND PROVINCIAL FAIRS.

California	Sacramento	Sept. 4-16
Canada	Toronto	Sept. 4-16
Connecticut	Meriden	Sept. 19-22
Delaware	Dover	Sept. 12-15
World's Columbian Exposition		
Illinois	Chicago	May 1-Nov. 1
Indiana	Indianapolis	Sept. 18-23
Iowa	Corn Palace, Sioux City	Sept. 20-Oct 18
Iowa	Des Moines	Sept. 1-8
Kansas	Topeka	Sept. 29-Oct. 7
Louisiana	Shreveport	Oct. 30-Nov.4
Maine	Lewiston	Sept. 5-8
Maryland	Hagerstown	Oct. 10-14
Massachusetts	Worcester	Sept. 4-8
Missouri	Sedalia	Sept. 25-30
Missouri	St. Louis	Oct. 2-7
Nebraska	Lincoln	Sept. 8-15
Nevada	Reno	Sept. 17-21
New Hampshire	Rochester	Sept. 26-29
New Jersey Interstate	Trenton	Sept. 25-29
New Jersey	Waverly Park	Sept. 4-9
New York and New England	Albany	Sept. 4-11
New York	Syracuse	Sept. 14-21
New York Interstate	Elmira	Aug. 28-Sept. 9
New York Interstate	Binghamton	Sept. 19-28
New York Western	Rochester	Sept. 25-30
North Carolina	Raleigh	Oct. 17-20
Ohio	Columbus Aug. 28-Sept. 1	
Ohio Interstate	Toledo	Aug. 21-26
Oregon	Salem	Sept. 11-16
Prince Edward Island	Charlottetown	Sept.26-29
Rhode Island	Cranston	Sept. 18-22
South Carolina	Columbia	Nov. 6-10
Texas	Dallas	Oct. 14-29
Virginia	Richmond	Oct. 10-13
Wisconsin Interstate	LaCrosse	Sept. 4-9
West Virginia	Wheeling	Sept. 4-8
Winnepeg (Manitoba)	Industrial	July 17-22

ALABAMA.

Marshall	Marshall	Sept. 26-29

ALABAMA DISTRICT.

Butler	Greenville	Oct. 24-28

ARKANSAS.

Bradley	Warren	Oct. 18-20
Ouachita	Camden	Oct. 24-28

ARKANSAS DISTRICT.

Hempstead	Hope	Oct. 17-21

CALIFORNIA.

Inyo	Bishop	Sept. 19-22
Lassen	Susanville	Sept. 25-29
Napa	Napa	Aug. 14-19
Plumas	Greenville	Oct. 3
San Benito	Hollister	Oct. 11-14
San Joaquin	Stockton	Sept. 18-30
Santa Barbara	Santa Barbara	Aug. 22-26
Santa Clara	San Jose	Sept. 25-30
Santa Cruz	Santa Cruz	Oct. 3-7
Stanislaus	Modesto	Sept. 26-29
Tehama	Red Bluff	Aug. 15-19

CONNECTICUT.

Hartford	Collinsville	Sept. 27-28
Litchfield	New Milford	Sept. 12-14
Litchfield	Watertown	Sept. 12-14
New Haven	Guilford	Sept. 27
New London	Norwich	Sept. 26-28

DELAWARE.

Fairview Park	Dover	Sept. 11-16

ILLINOIS.

Adams	Camp Point	Aug. 1-4
Brown	Mt. Sterling	Aug. 7-11
Bureau	Princeton	Sept. 5-8
Champaign	Homer	Aug. 8-11
Champaign	Champaign	Aug. 29-Sept. 1
Carroll	Mt. Carroll	Sept. 12-15
Coles	Charleston	Sept. 5-9
De Kalb	Sandwich	Sept. 18-22
De Witt	Clinton	Sept. 11-15
Edgar	Paris	Aug. 28-Sept. 1
Edwards	Albion	Sept. 19-22
Fulton	Canton	Sept. 19-22
Gallatin	Shawneetown	Aug. 22-26
Hamilton	McLeansboro	Aug. 8-11
Hancock	Carthage	Sept. 4-8
Hardin	Elizabethtown	Aug. 8-11
Jasper	Newton	Sept. 19-22
Jersey	Jerseyville	Oct. 10-13
Jo Daviess	Galena	Sept.26-29
Johnson	Vienna	Oct. 10-13
Knox	Knoxville	Sept. 5-8
Lake	Libertyville	Sept. 19-22
Livingston	Fairbury	Sept. 4-8
Logan	Atlanta	Sept. 5-8
McLean	Saybrook	Aug. 28-Sept. 1
Menard	Petersburg	Aug. 29-Sept. 1
Macon	Decatur	Aug. 28-Sept. 2
Mercer	Aledo	Sept. 19-22
Montgomery	Hillsboro	Aug. 25-28
Ogle	Oregon	Sept. 26-29
Perry	Pinckneyville	Oct. 3-6
Piatt	Monticello	Aug. 21-25
Pike	Griggsville	Aug. 15-18
Saline	Harrisburg	Aug. 15-18
Schuyler	Rushville	Aug. 14-18
Shelby	Shelbyville	Sept. 5-9
Tazewell	Delavan	Aug. 22-25
Tazewell	Mackinaw	Aug. 29-Sept. 1
Union	Anna	Aug. 29-Sept. 1
Union	Jonesboro	Sept, 12-15
Vermillion	Catlin	Aug. 15-18
Warren	Monmouth	Sept. 11-15
White	Carmi	Sept. 5-9
Williamson	Marion	Sept. 26-29

ILLINOIS DISTRICT.

Christian	Pana	Aug. 29-Sept. 2
De Witt	Farmer City	Aug. 15-18
Hancock	La Harpe Aug. 28-Sept. 1	
Henry	Kewanee	Sept. 11-15
La Salle	Mendota Aug. 30- Sept. 1	
Macon	Macon	Sept. 5-8
Saline	Eldorado Aug. 28-Sept. 1	
Stark	Wyoming Aug. 29-Sept. 1	
Vermillion	Hoopeston	Aug. 28-Sept. 1
Whiteside	Morrison	Sept. 5-8

INDIANA.

Benton-Warren	Boswell	Sept. 4-8
Bridgeton	Bridgeton	Aug. 7-12
Bourbon	Bourbon	Oct. 10-13
Carroll	Camden	Sept. 5-8
Carroll	Flora	Sept. 25-29
Clark	Charlestown	Aug. 28-Sept. 1
Clinton	Frankfort Aug. 28-Sept.2	
Coles	Charleston	Sept. 5-9
Crawford	Marengo	Aug. 21-25
Culver Park	Lake Maxinkuckee	Oct. 3-6
Daviess	Washington	Aug. 21-26
Dearborn	Lawrenceburgh	Aug. 22-26
Decatur	Greensburgh	Aug. 29-Sept. 2
DeKalb	Waterloo	Oct. 9-13
Delaware	Muncie	Aug. 14-18
Dubois	Huntingburgh	Sept. 18-23
Elkhart	Goshen	Oct. 2-6
Floyd	New Albany	Sept. 5-9
Fulton	Rochester	Sept. 13-16
Gibson	Oakland City	Aug. 21-26
Gibson	Princeton	Sept. 1-16
Grant	Marion	Sept. 5-8
Greene	Bloomfield	Sept. 18-23
Hamilton	Sheridan	Aug. 14-18
Hancock	Greenfield	Aug. 21-25
Harrison	Corydon	Aug. 28-Sept. 1
Henry	Middletown	Aug. 8-11
Huntington	Huntington	Oct. 3-7
Jackson	Seymour	Sept. 26-29
Jay	Portland	Sept. 22-29
Jefferson	Madison	Aug. 15-18
Jennings	North Vernon	Aug. 8-11
Johnson	Franklin	Aug. 29-Sept. 2
Knox	Vincennes	Oct. 9-14
Lake	Crown Point	Oct. 3-6
La Porte	La Porte	Sept. 26-29
Lawrence	Bedford	Sept. 12-16
Marshall	Plymouth	Oct. 3-6
Monroe	Bloomington	Sept. 26-30
Montgomery	Crawfordsville	Sept. 11-15
Newton	Morocco	Sept. 12-15
Noble	Kendallville	Sept. 25-29
Parke	Rockville	Aug. 21-25
Perry	Rome	Sept. 18-23
Pike	Petersburg	Aug. 28-Sept. 2
Porter	Valparaiso	Sept. 19-22
Posey	New Harmony	Sept.12-15
Posey	Mt. Vernon	Sept. 26-30
Pulaski	Winamac	Oct. 3-6
Putnam	Bainbridge	Sept. 4-8
Randolph	Winchester	Aug. 29-Sept. 1
Ripley	Orgood	Aug. 1-3
Rush	Rushville	Sept. 12-15
Scott	Scottsburgh	Sept. 12-15
Shelby	Shelbyville	Sept. 5-9
Spencer	Rockport	Sept. 25-30
Spencer	Chrisney	Sept. 4-9
St. Joseph	New Carlisle	Oct. 11-13
Steuben	Angola	Sept. 19-22
Sullivan	Sullivan	Sept. 4-9
Switzerland	East Enterprise	Aug. 31-Sept. 1
Tippecanoe	Lafayette	Aug. 4-8
Vanderburgh	Evansville	Aug. 18-23
Vermillion	Cayuga	Aug. 25-29
Vermillion	Newport	Oct. 3-7
Wabash	Wabash	Sept. 19-22
Wabash	No. Manchester	Sept. 26-29
Warren	Indianola	Sept. 12-15
Warrick	Boonville	Aug. 28-Sept.2
Washington	Salem	Aug. 22-25
Wayne	Dalton	Oct. 3-6
Wayne	Hagerstown	Aug. 8-11
Whitley	Columbia City	Oct. 4-7

INDIANA DISTRICT.

Fountain	Covington	Sept. 18-22
Marshall	Bourbon	Oct. 10-13
Marshall	Bremen	Sept. 26-29
Parke	Bridgeton	Aug. 7-11
Pulaski	Francesville	Sept. 26-29
Washington and Clark	Pekin	Sept. 12-15

IOWA.

Adair	Greenfield	Sept. 26-29
Adams	Corning	Sept. 26-29
Allamakee	Waukon	Sept. 19-22
Appanoose	Centerville	Sept. 19-22
Audubon	Audubon	Sept. 4-7
Benton	Vinton	Sept. 12-15
Boone	Ogden	Sept. 19-22
Buchanan	Independence	Sept. 12-15
Buena Vista	Alta	Sept. 6-8
Butler	Allison	Sept. 11-14
Calhoun	Rockwell City	Sept. 26-29
Carroll	Carroll	Sept. 12-15
Cass	Atlantic	Sept. 11-14
Cedar	West Branch	Aug. 22-25
Cedar	Tipton	Aug. 29-Sept. 1
Cerro Gordo	Mason City	Sept. 26-28
Cherokee	Marcus	Sept. 20-22
Chickasaw	New Hampton	Sept. 6-8
Clarke	Osceola	Sept. 26-29
Clayton	National	Sept. 5-8
Clinton	De Witt	Sept. 12-15
Crawford	Denison	Sept. 19-22
Dallas	Adel	Sept. 19-22
Davis	Bloomfield	Sept. 19-22
Decatur	Leon	Sept. 19-22
Delaware	Manchester	Sept. 12-15
Fayette	West Union	Sept. 5-8
Floyd	Charles City	Sept. 20-22
Franklin	Hampton	Sept. 5-7
Greene	Jefferson	Aug. 22-26
Grundy	Grundy Center	Sept. 20-22
Guthrie	Guthrie Center	Sept. 26-29
Hamilton	Webster City	Sept. 12-15
Hancock	Britt	Sept. 19-21
Hardin	Eldora	Sept. 12-15
Harrison	Missouri Valley	Oct. 3-6
Howard	Cresco	Sept. 5-8
Humboldt	Humboldt	Sept. 26-29
Ida	Ida Grove	Sept. 19-21
Iowa	South Amqua	Sept. 13-15
Jackson	Maquoketa	Sept. 19-22
Jasper	Newton	Sept. 26-29
Jefferson	Smithfield	Sept. 27-29
Jefferson	Fairfield	Sept. 12-14
Johnson	Iowa City	Aug. 28-Sept. 1
Jones	Monticello	Sept. 4-8
Keokuk	Sigourney	Oct. 10-13
Kossuth	Algona	Sept. 27-29
Lee	Donnellson	Sept. 5-8
Linn	Central City	Sept. 12-15
Louisa	Wapello	Sept. 5-8
Lucas	Chariton	Sept. 25-28
Madison	Winterset	Sept. 18-21
Mahaska	Oskaloosa	Sept. 18-21
Mahaska	New Sharon	Sept. 13-16
Marion	Knoxville	Sept. 19-22
Mills	Malvern	Sept. 26-29
Mitchell	Osage	Sept. 13-15
Montgomery	Red Oak	Sept. 18-22
Muscatine	Muscatine	Sept. 5-8
Page	Clarinda	Sept. 4-8
Palo Alto	Emmetsburg	Sept. 27-29
Poweshiek	Grinnell	Sept. 11-14
Ringgold	Mt. Ayr	Sept. 12-15
Sac	Sac City	Sept. 14-16
Shelby	Harlan	Aug. 28-31
Story	Nevada	Sept. 19-22
Tama	Toledo	Sept. 26-29
Taylor	Bedford	Aug. 28-Sept. 1
Union	Afton	Sept. 12-15
Van Buren	Keosauqua	Aug. 29-Sept. 1
Wapello	Ottumwa	Aug. 14-18
Webster	Fort Dodge	Oct. 2-5
Winnebago	Forest City	Sept. 12-16
Worth	Northwood	Sept. 27-29
Wright	Clarion	Sept. 12-15

IOWA DISTRICT.

Cedar	Mechanicsville	Sept. 19-22
Clayton	Strawberry Point	Aug. 29-Sept. 1
Henry	Winfield	Sept. 12-14
Jones	Anamosa	Aug. 22-25
Keokuk	What Cheer	Sept. 26-29
Monona	Mapleton	Sept. 20-23
Muscatine	West Liberty	Sept. 12-15
Page	Shenandoah	Sept. 12-15
Pocahontas	Fonda	Aug. 29-Sept. 1
Sac	Odebolt	Sept. 11-13
Tama	Traer	Sept. 19-21
Union	Creston	Aug. 28-Sept. 1
Wapello	Eldon	Sept. 5-8
Wapello	Agency	Sept. 26-29
Wright	Eagle Grove	Sept. 18-21

KANSAS.

Anderson	Garnett	Aug. 29-Sept. 1
Coffey	Burlington	Sept. 4-8
Cowley	Winfield	Sept. 5-8
Crawford	Girard	Sept. 12-15
Dickinson	Abilene	Aug. 29-Sept. 1
Greeley	Horace	Sept. 27-29
Jackson	Holton	Sept. 26-29
Labette	Parsons	Sept. 4-8
Linn	Mound City	Sept. 5-8
Marshall	Frankfort	Sept. 26-29
Miami	Paola	Oct. 3-6
Neosho	Erie	Aug. 29-Sept. 1
Osage	Burlingame	Sept. 26-29
Riley	Riley	Sept. 27-29
Wilson	Fredonia	Aug. 29-Sept. 1

KANSAS DISTRICT.

Johnson	Edgarton	Sept. 19-22
Nemaha	Sabetha	Sept. 5-8
Sedgwick	Wichita	Sept. 11-15

KENTUCKY.

Adair	Columbia	Aug. 22-25
Bourbon	Paris	Sept. 5-9
Boyle	Danville	Aug. 1-4
Caldwell	Princeton	Sept. 27-30
Campbell	Alexandria	Aug. 22-26
Clarke	Winchester	Sept. 12-16
Daviess	Owensboro	Oct. 3-7
Fayette	Lexington	Aug. 29-Sept. 2
Hart	Horse Cave	Sept. 19-22
Henry	Eminence	July 19-22
Hopkins	Madisonville	Aug. 30-Sept. 2
Jefferson	Fern Creek	Aug. 22-24
Laurel	London	Aug. 23-25
Mason	Germantown	Oct. 11-14
Mason	Maysville	Aug. 22-26
Mercer	Harrodsburg	Sept. 5-8
Montgomery	Mt. Sterling	July 4-7
Muhlenberg	Greenville	Oct. 11-14
Ohio	Hartford	Sept. 27-30
Oldham	near La Grange	Aug. 30-31
Pulaski	Somerset	Sept. 12-15
Simpson	Franklin	Aug. 30-Sept. 2
Taylor	Campbellsville	July 18-21
Union	Uniontown	Aug. 15-19

KENTUCKY DISTRICT.

Anderson	Lawrenceburgh	Aug.8-11

MAINE.

Androscoggin	"Evergreen Park" Livermore Falls	Aug. 22-24
Aroostook	Houlton	Sept. 20-21
Franklin	Farmington	Sept. 26-28
Penobscot	Bangor	Aug. 29-Sept. 1
Sagadahoe	Topsham	Oct. 10-12

MARYLAND.

Baltimore	Timonium	Aug. 29-Sept. 1
Cecil	Elkton	Sept. 5-8
Frederick	Frederick City	Oct. 10-13
Harford	Belair	Oct. 10-13
Montgomery	Rockville	Sept. 6-8
Talbot	Easton	Sept. 19-22

MASSACHUSETTS.

Barnstable	Barnstable	Sept. 12-14
Berkshire	Great Barrington	Sept. 27-29
Berkshire	North Adams	Sept. 19-21
Berkshire	Pittsfield	Sept. 12-15
Bristol	Taunton	Sept. 27-29
Hampden	Palmer	Sept. 19-20
Hampshire	Northampton	Sept. 19-20
Middlesex	Lowell	Sept. 14-16
Middlesex	Medford	Sept. 19-20
Middlesex	So. Framingham	Sept. 12-13
Nantucket	Nantucket	Sept. 6-7
Plymouth	Bridgewater	Sept. 20-22
Worcester	Athol	Oct. 3-4
Worcester	Barre	Sept. 28-29
Worcester	Fitchburg	Sept. 19-20
Worcester	Lancaster	Sept. 14-15
Worcester	Oxford	Sept. 19-20
Worcester	Sturbridge	Sept. 14 15
Worcester	Worcester	Sept. 4-8

MICHIGAN.

Allegan	Allegan	Sept. 26-30
Barry	Hastings	Sept. 26-29
Branch	Coldwater	Sept. 25-29
Calhoun	Marshall	Sept. 26-29
Cass	Dowagiac	Oct. 3-6
Charlevoix	East Jordan	Sept. 20-22
Genesee	Flint	Sept. 19-22
Hillsdale	Hillsdale	Oct. 2-6
Ingham	Stockbridge	Oct. 3-5
Ionia	Ionia	Sept. 26-29
Kent	Cedar Springs	Sept. 5-8
Kent	Grand Rapids	Sept. 18-22
Lapeer	Hadley	Oct. 3-5
Lapeer	Lapeer	Sept. 20-22
Lenawee	Adrian	Sept. 25-29
Livingston	Howell	Sept. 26-28
Macomb	Armada	Oct. 4-6
Mecosta	Big Rapids	Sept. 19-21
Oakland	Pontiac	Sept. 26-29
Oceana	Hart	Sept. 26-29
Wayne	Plymouth	Sept. 19-22

MINNESOTA.

Fillmore	Preston	Sept. 12-15
Freeborn	Albert Lea	Sept. 4-6
Nicollet	St. Peter	Sept. 14-16
Nobles	Worthington	Sept. 26-28
Steele	Owatonna	Sept. 14-16
Stevens	Morris	Sept. 29-30
Todd	Long Prairie	Sept. 19-21

MISSOURI.

Adair	Kirksville	Sept. 18-22
Atchison	Rockport	Sept. 12-15
Atchison	Tarkio	Aug. 29-Sept. 2
Bates	Rich Hill	Aug. 22-25
Buchanan	St. Joseph	Sept. 18-23
Caldwell	Hamilton	Sept. 5-8
Callaway	Fulton	Sept. 12
Carroll	Carrollton	Sept. 5-8
Clinton	Cameron	Sept. 12-15
Dale	Lockwood	Sept. 12-15
Franklin	Washington	Sept. 7-9
Gasconade	Hermann	Sept. 1-2
Grundy	Trenton	Sept. 12-15
Holt	Maitland	Aug. 21-25
Jackson	Kansas City	Sept. 25-30
Johnson	Holden	Aug. 15-18
La Fayette	Higginsville	Aug. 7-12
Lewis	La Belle	Sept. 12-15
Lincoln	Troy	Sept. 5-8
Livingston	Chillicothe	Aug. 29-Sept. 1
Macon	Macon	Aug. 22-25
Moniteau	California	Sept. 19-22
Moniteau	Tipton	Aug. 29-Sept. 2
Monroe	Paris	Sept. 5-9
Montgomery	Rockville	Sept. 6-8
Pike	Louisiana	July 24-29
Platte	Platte	Aug. 29-Sept. 2
Polk	Bolivar	Sept. 27-30
Randolph	Moberly	Aug. 15-19
St. Charles	St. Charles	Sept. 13-15
Saline	Marshall	Aug. 1-5
Scotland	Memphis	Sept. 5-8
Shelby	Shelbina	Aug. 15-18
Sullivan	Milan	Sept. 6-9

MISSOURI DISTRICT.

Cape Girardeau	Cape Girardeau	Oct. 10-14
Harrison	Ridgeway	Sept. 5-8
Macon	La Plata	Aug. 29-Sept. 1

NEBRASKA.

Antelope	Neligh	Sept. 20-22
Buffalo	Kearney	Sept. 19-22
Burt	Tekamah	Sept. 20-22
Butler	David City	Sept. 19-22
Colfax	Schuyler	Sept. 4-7
Dixon	Ponca	Sept. 12-15
Dodge	Fremont	Sept. 17-21
Douglas	Omaha	Sept. 4-8
Hall	Grand Island	Sept. 26-29
Hamilton	Aurora	Sept. 5-8

Johnson	Tecumseh	Aug. 30-Sept.1
Kearney	Minden	Sept. 19-22
Keith	Ogalalla	Sept. 27-29
Nemaha	Auburn	Sept. 26-29
Perkins	Madrid	Sept. 21-23
Platte	Columbus	Sept. 27-29
Polk	Osceola	Sept. 5-8
Sarpy	Papillion	Sept. 20-22
Saunders	Wahoo	Sept. 19-22
Seward	Seward	Sept. 26-29
Stanton	Stanton	Oct. 3-6
Thayer	Hebron	Sept. 27-29
York	York	Sept. 19-22

NEBRASKA DISTRICT.

Richardson	Falls City	Sept. 5-8

NEW HAMPSHIRE.

Cheshire	Rindge	Sept. 27
Rockingham	South Hampton	Oct. 4-5

NEW JERSEY.

Burlington	Mt. Holly	Sept. 19-22
Cumberland	Bridgeton	Sept. 5-7
Putnam	Carmel	Aug. 29-Sept. 1
Salem	Woodstown	Aug. 29-31

NEW YORK.

Allegany	Angelica	Sept. 12-14
Broome	Whitney's Point	Sept. 5-8
Cattaraugus	Little Valley	Sept. 4-7
Cayuga	Weedsport	Sept. 26-29
Chautauqua	Jamestown	Sept. 4-7
Chemung	Elmira	Sept. 19-22
Chenango	Norwich	Sept. 19-22
Clinton	Plattsburgh	Sept. 12-15
Columbia	Chatham	Sept. 5-8
Columbia	Hudson	Aug. 29-Sept. 1
Conewango Valley	Randolph	Sept. 18-21
Cortland	Cortland	Oct. 3-6
Delaware	Delhi	Sept. 26-28
Erie	Hamburgh	Sept. 19 22
Essex	Westport	Sept. 4-7
Franklin	Malone	Sept. 26-29
Fulton	Johnstown	Sept. 4-7
Genesee	Batavia	Sept. 19-21
Greene	Cairo	Sept. 5-7
Herkimer	Herkimer	Sept. 5-8
Jefferson	Watertown	Sept. 19-22
Lewis	Lowville	Sept. 12-15
Livingston	Geneseo	Oct. 2-4
Miami	Troy	Sept. 25-29
Monroe	Rochester	Sept. 25-30
Montgomery	Fonda	Aug. 28-31
Niagara	Lockport	Sept. 28-30
Oneida	Rome	Sept. 25-29
Ontario	Canandaigua	Sept. 26-28
Orange	Warwick	Sept. 19-22
Orleans	Albion	Sept. 21-23
Oswego	Oswego	Sept. 5-8
Otsego	Cooperstown	Sept. 18-20
Putnam	Carmel	Aug. 29-Sept. 1
Queens	Mineola	Sept. 26-29
Rensselaer	Troy	Aug. 28-Sept. 2
Rockland	Spring Valley	Oct. 3-6
St. Lawrence	Canton	Sept. 12-15
Saratoga	Ballston	Sept. 12-15
Schoharie	Cobleskill	Sept. 25-28
Schuyler	Watkins	Sept. 13-15
Seneca	Waterloo	Sept. 26-28
Steuben	Bath	Sept. 26-29
Steuben	Hornellsville	Aug. 28-Sept. 1
Suffolk	Riverhead	Oct. 3-5
Sullivan	Monticello	Sept. 5-8
Tioga	Newark Valley	Aug. 29-31
Tioga	Owego	Sept. 12-14
Tompkins	Dryden	Sept. 26-28
Tompkins	Ithaca	Sept. 12-15
Tompkins	Trumansburg	Sept. 20-22
Ulster	Ellenville	Sept. 12-14
Warren	Glens Falls	Sept. 19-22
Washington	between Ft. Edward and Sandy Hill	Sept.11-15
Wayne	Lyons	Sept. 27-30
Westchester	White Plains	Sept. 25-30
Wyoming	Warsaw	Sept. 26-27
Yates	Penn Yan	Sept. 19-21

NEW YORK DISTRICT.

Broome	Windsor	Sept. 12-15
Chenango	Greene	Sept. 12-15
Monroe	Brockport	Sept. 28-30
Washington	Cambridge	Sept. 5-8

NORTH CAROLINA.

Rowan	Salisbury	Oct. 3-5

OHIO.

Adams	West Union	Sept. 12-15
Allen	Lima	Sept. 26-29
Ashland	Ashland	Sept. 6-8
Athens	Athens	Sept. 12-14
Auglaize	New Bremen	Aug. 29-Sept. 1
Auglaize	Wapakoneta	Oct. 3-6
Belmont	St Clairsville	Sept. 26-28
Brown	Georgetown	Oct. 3-6
Butler	Hamilton	Oct. 2-6
Carroll	Carrollton	Sept. 19-21
Champaign	Urbana	Aug. 22-25
Clark	Springfield	Aug. 8-11
Clermont	Blowville	Sept. 4-8
Clinton	Wilmington	Sept. 5-8
Columbiana	Salem	Sept. 19-22
Coshocton	Coshocton	Oct. 10-13
Crawford	Bucyrus	Sept. 26-29
Cuyahoga	Chagrin Falls	Sept. 12-15
Darke	Greenville	Sept. 11-15
Delaware	Flint	Sept. 26-29
Erie	Sandusky	Sept. 19-22
Fairfield	Lancaster	Oct. 10-14
Fayette	Washington, C. H.	Aug. 22-26
Franklin	Columbus	Aug. 28-Sept. 1
Fulton	Wauseon	Sept. 19-22
Gallia	Gallipolis	Aug. 8-11
Geauga	Burton	Sept. 26-29
Guernsey	Washington	Sept. 26-29
Hamilton	Carthage	Aug. 15-18
Hancock	Findlay	Sept. 20-23
Hardin	Kenton	Sept. 5-8
Harrison	Cadiz	Oct. 3-5
Henry	Napoleon	Sept. 12-15
Hocking	Logan	Sept. 27-30
Holmes	Millersburg	Sept. 26-29
Huron	Norwalk	Sept. 5-8
Jefferson	Smithfield	Sept. 27-29
Lake	Painesville	Aug. 29-Sept. 1
Licking	Newark	Oct. 3-6
Logan	Bellefontaine	Oct. 3-6
Lorain	Elyric	Sept. 26-29
Lucas	Toledo	Sept. 4 9
Madison	London	Sept. 5-8
Mahoning	Youngstown	Sept. 5-9
Marion	Marion	Oct. 3-6
Medina	Medina	Sept. 5-7
Meigs	Pomeroy	Sept. 5-7
Mercer	Celina	Aug. 22-25
Miami	Troy	Sept. 25-29
Monroe	Woodsfield	Sept. 5-7
Morgan	McConnelsville	Sept. 5-8
Morrow	Mt. Gilead	Sept. 19-22
Muskingum	Zanesville	Sept. 26-29
Noble	Sarahsville	Oct. 4-6
Pauilding	Pauldding	Sept. 12-15
Perry	New Lexington	Sept. 7-9
Portage	Ravenna	Sept. 19-22
Preble	Eaton	Sept. 25-29
Putnam	Ottawa	Oct. 3-7
Ransom	Plymouth	Sept. 19-22
Richland	Mansfield	Sept. 26-29
Ross	Chillicothe	Aug. 8-11
Sandusky	Fremont	Sept. 26-29
Scioto	Portsmouth	Aug. 1-4
Seneca	Fostoria	Aug. 29-Sept. 1
Shelby	Sidney	Sept. 19-22
Stark	Canton	Sept. 25-29
Summit	Akron	Oct. 3-6
Tuscarawas	Canal Dover	Sept. 19-22
Trumbull	Warren	Sept. 12-15
Union	Marysville	Oct. 10-13
Van Wert	Van Wert	Sept. 5-8
Vinton	McArthur	July 25-28
Warren	Lebanon	Sept. 19-22
Wayne	Wooster	Sept. 19-21
Williams	Montpelier	Sept. 12-15
Wood	Bowling Green	Sept. 26-30

OHIO DISTRICT FAIR.

Hardin	Ada	Aug. 22-25

PENNSYLVANIA.

Allegheny	Tarentum	Aug. 29-Sept. 1
Armstrong	Dayton	Sept. 26-29
Armstrong	Parker	Sept. 12-15
Beaver	Beaver	Sept. 26-29
Beaver	Hookstown	Aug. 22-24
Bedford	Bedford	Sept. 26-29
Berks	Reading	Sept. 12-15
Berks	Kutztown	Sept. 19-21
Blair	Hollidaysburg	Sept. 12.15
Bradford	East Towanda	Sept. 26-29
Bradford	Canton	Sept. 19-22
Bradford	Troy	Sept. 12-15
Butler	Butler	Sept. 5-8
Cambria	Ebensburg	Sept. 26-30
Cambria	Carrolltown	Oct. 3-6
Carbon	Lehighton	Sept. 12-15
Chester	West Chester	Aug. 3f-Sept. 2
Chester	Oxford	Sept. 26-29
Clarion	Clarion	Sept. 19-22
Columbia	Bloomsburg	Oct. 10-14
Columbia	Berwick	Oct. 4-7
Crawford	Conneautville	Sept. 13-15
Crawford	Cochranton	Sept. 6-8
Crawford	Titusville	Sept. 5-8
Crawford	Cambridgeboro	Sept. 19-22
Cumberland	Carlisle	Sept. 26-29
Dauphin	Gratz	Sept. 12-15
Erie	Corry	Sept. 12-15
Erie	Wattsburg	Sept. 5-8
Fayette	Uniontown	Sept. 5-8
Greene	Carmichaels	Oct. 4-5
Indiana	Indiana	Sept. 11-15
Jefferson	Brookville	Sept. 26-29
Juniata	Port Royal	Sept. 6-9
Lackawanna	Scranton	Sept. 12-15
Lawrence	New Castle	Aug. 29-Sept. 1
Lehigh	Allentown	Sept. 25-29
Luzerne	Dallas	Oct. 4-5
Lycoming	Hughesville	Sept. 26-29
McKean	Port Allegany	Sept. 12.15
Mercer	Stoneboro	Sept. 26-29
Mercer	Mercer	Sept. 12-14
Mifflin	Lewiston	Dec. 26-28
Monroe	Stroudsburg	Sept. 5-9
Montgomery	Pottstown	Oct. 3-6
Montour	Danville	Sept. 26-30
Northampton	Nazareth	Oct. 3-6
Northampton	Bethlehem	Sept. 18-23
Northumberland	Milton	Oct. 3-6
Northumberland	Shamokin	Aug. 16-19
Perry	Newport	Sept. 19-22
Potter	Coudersport	Sept. 5-8
Schuylkill	Orwigsburg	Sept. 6-8
Schulykill	Ringtown	Aug. 30-Sept.1
Schuylkill	Lavelle	Aug. 22-24
Sullivan	Forksville	Oct. 2-4
Susquehanna	Montrose	Sept. 26-27
Susquehanna	Harford	Oct. 4-5
Tioga	Westfield	Sept. 18-22
Tioga	Mansfield	Sept. 26-29
Union	Lewisburg	Sept. 26-29
Warren	Warren	Sept. 12-15
Washington	Washington	Aug. 29-Sept. 1
Washington	Burgettstown	Oct. 3-5
Wayne	Honesdale	Sept. 26-28
Westmoreland	Greensburg	Sept. 5-8
Wyoming	Tunkhannock	Sept. 20-22
York	York	Oct. 2-6
York	Hanover	Sept. 12-15

RHODE ISLAND.

Providence	Woonsocket	Sept. 12-14

SOUTH CAROLINA.

Fairfield	Winnsboro	Oct. 31-Nov. 2

SOUTH DAKOTA.

Clay	Vermillion	Sept. 26-30

TENNESSEE.

Anderson	Clinton	Sept. 5-8
Henry	Paris	Oct. 32-27
Lincoln	Fayetteville	Sept. 20-23
London	London	Sept. 26-29
Maury	Columbia	Oct. 3-7
Rutherford	Murfreesboro	Sept. 12-16

TEXAS.

Brown	Brownwood	Oct. 3-7
McLennan	McGregor	Sept. 28-Oct. 5
Tom Green	San Angelo	Sept. 26-30

VERMONT.

Caledonia	St. Johnsbury	Sept. 12-14
Franklin	Sheldon Junction	Sept. 13-15
Rutland	Rutland	Oct. 3-5
Windham	Brattleboro	Sept. 27-28
Windsor	Woodstock	Sept. 26-28

VERMONT DISTRICT.

Rutland	Fair Haven	Sept. 26-29

VIRGINIA.

Botetourt	Fincastle	Oct. 17-20
Loudoun	Leesburg	Aug. 29.31
Northumberland	Heathsville	Sept. 27 29
Shenandoah	Woodstock	Oct. 3-6

VIRGINIA DISTRICT.

Frederick	Winchester	Sept. 12-15
Spottsylvania	Fredericksburg	Sept. 26-28

WEST VIRGINIA.

Greenbr	Lewisburg	Aug. 29-Sept. 1
Harrison	Clarksburg	Aug. 22-24
Mason	Pt. Pleasant	Aug. 22-25
Ritchie	Pennsboro	Sept. 12-15
Tyler	Middlebourne	Aug. 29-31
Wetzel	New Martinsville	Aug. 22-25
Wood	Parkersburg	Aug. 29-Sept. 1

WISCONSIN.

Adams	Friendship	Sept. 20-22
Barron	Chetek	Sept. 20-22
Calumet	Chilton	Sept. 26-29
Columbia	Portage	Sept. 12-15
Dodge	Beaver Dam	Sept. 26-29
Door	Sturgeon Bay	Sept. 27-30
Dunn	Menomonee	Sept. 13-15
Grant	Bloomington	Sept. 6-8
Green	Monroe	Sept. 13-16
Iowa	Dodgeville	Aug. 29-31
Jackson	Black River Falls	Sept. 12-15
Jefferson	Jefferson	Sept. 26-29
Juneau	Mauston	Sept. 12-14
Manitowoc	Manitowoc	Sept. 5-8
New London	New London	Oct. 3-6
Oshkosh	Oshkosh	Sept. 18-23
Ozaukee	Cedarburg	Sept. 20-22
Pepin	Durand	Sept. 20-22
Rock	Janesville	Sept. 12-15
Sheboygan	Sheboygan	Sept. 26-29
Vernon	Viroqua	Sept. 19-22
Waukesha	Waukesha	Sept. 12-15
Waupaca	Weyauwega	Sept. 26-28

WISCONSIN DISTRICT.

Brown, N. E. Dist.	Green Bay	Sept. 12-15
Fon du Lac	Fon du Lac	Sept. 12-15

ONTARIO.

Brant	Brandford	Sept. 26-28
Brant	Paris	Oct. 3-4
Bruce	Paisley	Sept. 26-27
Bruce	Walkerton	Sept. 26-28
Carleton	Ottawa	Sept. 22-30
Elgin	Aylmer	Oct. 2 4
Elgin	Ridgetown	Oct. 9-11
Frontenac	Harrowsmith	Sept. 20-21
Frontenac	Kingston	Sept. 25-29
Grenville	Prescott	Sept. 26-28
Grey	Durham	Sept. 26-27
Haldimand	Cayuga	Oct. 3-4
Hastings	Belleville	Sept. 19-22
Kent	Chatham	Oct. 3-5
Lanark	Perth	Sept. 19-21
Lanark	Almonte	Oct. 3-5
London	London	Sept. 14-23
Lincoln	St. Catharines	Sept. 25-27
Norfolk	Simcoe	Oct. 17-19
Norfolk	Tilsonburg	Sept. 28-29
Ontario	Cannington	Sept. 28-29
Ontario	Whitby	Sept. 19-21
Oxford	Otterville	Oct. 6-7
Oxford	Woodstock	Sept. 26-27
Peel	Brampton	Sept. 28-29
Perth	Milverton	Sept. 26-27
Perth	Stratford	Sept. 28-29
E. Peterborough	Norwood	Oct. 10-11
C. Peterborough	Peterborough	Sept. 25-27
Prince Edward	Picton	Sept. 12-13
Renfrew	Beachburg	Oct. 5-6
Simcoe	Collingwood	Sept. 26-29
Simcoe	Stayner	Oct. 3-5
Stormont	Cornwall	Sept. 15-16
Toronto	Toronto	Sept. 4-16
Victoria	Lindsay	Sept. 27-28
Waterloo	Wellesley	Sept. 19-20
Wellington	Arthur	Oct. 3-4
Wellington	Elora	Oct. 5-6
Wellington	Guelph	Sept. 19-21
York	Markham	Oct. 4-6
York	Woodbridge	Oct. 17-18

ONTARIO DISTRICT.

Grey	Walters Fall	Sept. 26-27
Joliette	Joliette	Oct. 3

QUEBEC.

Sherbrooke	Sherbrooke	Sept. 4-7
Stanstead	Stanstead	Aug. 23-24
Argentine	Lachute	Sept. 13-14

MANITOBA.

Winnipeg	Winnipeg	July 17-22

THE PEERLESS ATLAS OF THE WORLD!

AND THE

AMERICAN AGRICULTURIST ONE YEAR FOR ONLY $1.75 POSTPAID

OR GIVEN FOR 2 NEW SUBSCRIBERS.

130 Pages, Each 14 By 11 Inches. Over 200 Large Maps and Illustrations. Royal Edition. In Handsome and Heavy Leatherette Broad Covers, with Rich Gold Ornamental Title. A New and Revised Edition of this Popular Atlas of the World Has Just Been Published.

Embracing New Features Not Found In Any Previous Edition.

IT GIVES THE POPULATION OF EACH STATE AND TERRITORY, OF ALL COUNTIES OF THE UNITED STATES, OF AMERICAN CITIES WITH OVER 8,000 INHABITANTS, BY THE CENSUS OF 1890.

Magnificent Illustrations embellish nearly every page of the letter-press matter and faithfully depict scenes in almost every part of the world. They are intensely interesting, and constitute an art collection which will be viewed with pleasure and admiration for years to come. The Peerless Atlas meets the wants of the people more completely than any similar publication. The latest edition contains new maps never before published, including a new colored map showing the latest divisions of the new Territory of Oklahoma, while accurate and timely information, statistical and otherwise, is brought down to the latest date. As an Atlas and general reference book it is broad and comprehensive, valuable alike to the merchant, the farmer, the professional man—in fact, everybody.

It is Equal to any $10 Atlas. To keep pace with the progress of the age, to understand comprehensively and intelligently the current happenings, daily telegraphed from all parts of the earth, you must have at hand the latest edition of the "Peerless Atlas of the World."

The Peerless Atlas contains a large amount of interesting data and numerous beautiful illustrations of the more conspicuous buildings, relating to the **World's Columbian Exposition** in 1893, an event about which everybody is talking, and concerning which all want reliable and authentic information. Too much cannot be said in praise of this Peerless Atlas.

Larger and Finer Maps than are Found in $5 and $10 Atlases. **It Contains a General Description of the World,** giving its physical features—form, destiny, temperature, motion, the seasons, climatic conditions, winds and currents; distribution of land and water; heights of mountains and lengths of rivers; races of people and their religions; an historical chapter on polar explorations; also the most complete list of nations ever published, giving their geographical locations, area, population and form of government. Every schoolboy and girl, as well as college student, will find it an invaluable aid in the study of geography in all its phases.

Price **$1.00**, with the AMERICAN AGRICULTURIST one year **$1.75.**

OUR LIBRARY CORNER.

Announcement of Three Autumn Books.

Bulbs and Tuberous Rooted Plants.

This manual is by C. L. Allen, of Floral Park. The demand for a book describing in a trustworthy manner how to grow Bulbs and Tuberous-Rooted Plants in the open ground, as well as in the greenhouse and window garden; how to propagate them; how to succed and avoid failure, has long been urgent. No other class of plants occupies so important a place in the field of floriculture as do the various kinds of flowering bulbs, and is at the same time so little understood. The amount of money annually expended for bulbs is more than is paid for any other class of flowering plants. As generally treated, bulbs are an expensive luxury, while, when properly managed, they afford the greatest amount of pleasure at the least cost. The author of this book has for many years made bulb growing a specialty, and is a recognized authority on their cultivation and management. He has taken the initiative in this country to make bulb growing a special industry, and therefore writes from his own long and extensive experience. The illustrations which embellish this work have been drawn from nature, and have been engraved expressly for this book. The cultural directions are plainly stated, practical, and to the point. Mr. Allen renounces the idea that it is difficult to successfully raise flowering bulbs, and shows that their necessary requirements are simple and few. What not to grow forms an important feature in this book, which is of especial value to many beginners who usually undertake to grow many kinds which even the professional florist could not accomplish in a satisfactory manner, under existing conditions. The method of using a special soil for each kind of plant — as is frequently recommended—has discouraged many flower lovers from growing bulbs. This erroneous idea is so plainly exposed that many persons who read this book will again become encouraged to undertake what they had hitherto thought impossible to accomplish. The losses of bulbs from overestimating their hardiness are clearly recounted, and the simple remedies to prevent such losses are so plainly indicated and described, that any one following these directions will suffer very little loss in the future. Published by Orange Judd Company. Price, in cloth, postpaid, $2.

Greenhouse Construction.

A complete treatise by Prof. L. R. Taft, of Michigan Agricultural College, on greenhouse structures and arrangements of the various forms and styles of Plant Houses for professional florists as well as amateurs. All the best and most approved structures are so fully and clearly described that anyone who desires to build a greenhouse will have no difficulty in determining the kind best suited to his purpose. All the modern and most successful methods of heating and ventilating are fully treated. Special chapters are devoted to houses used for the growing of one kind of plant exclusively. The construction of hotbeds and frames receives appropriate attention. No work has ever been published on this subject which is so practical and complete in every detail. Over 100 excellent illustrations, especially engraved for this work, make every point clear to the reader and add considerably to the artistic appearance of the book. Published by Orange Judd Company, New York. Price, bound in cloth, postpaid, $1.50.

Greenhouse Management.

This book, by Prof. L. R. Taft of Michigan Agricultural College, forms an almost indispensable companion volume to Greenhouse Construction. In it the author gives the results of his many years' experience, together with that of the most successful florists and gardeners, in the management of growing plants under glass. So minute and practical are the various systems and methods of growing and forcing roses, violets, carnations, and all the most important florists' plants, as well as grapes, fruits and vegetables described, that by a careful study of this work, and the following of its teachings, failure is almost impossible. Like the preceding volume, it is richly and beautifully illustrated. Published by Orange Judd Company, New York. Price, bound in cloth, postpaid, $1.

Other Book Reviews.

BRITISH DAIRYING. A Handy Volume on the Work of the Dairy Farm. For the use of technical instruction classes, students in agricultural colleges and dairy farmers. By Prof. J. P. Sheldon. Late Special Commissioner of the Canadian Government. With numerous illustrations. London: Crosby, Lockwood & Son. 1893. 170 pp., il., 12 mo., cloth.

This volume is based on a series of eight articles which were published in the summer of 1892, and which received so large a measure of favor as to justify the belief that they should be republished in book form, and the result justifies the assumption. As compared with a quarter of a century ago, there is a greatly awakened interest taken in dairying, and a very substantial amount of progress in dairy reform has been attained. In this treatise the subject is treated scientifically, and seven new chapters have been added to the original and expanded eight, the whole forming a useful book on practical dairying, suitable for students in schools and agricultural colleges, and for dairymen. Sold by Orange Judd Company. Price, postpaid, $1.

CHICAGO AND ITS ENVIRONS. A Complete Guide to the Inland City and to the World's Fair. Columbian Edition. Illustrated. Chicago: F. P. Kenkel (L. Schick). 1893. 575 pp., il., map., 12 mo., flexible cloth. $2.

This excellent guide book contains chapters on American railroads and their methods; How to reach Chicago, describing all routes to the city, with their time of travel, scenery, and notes of interest on the places passed through; How to live in Chicago, with hotels and all public and private institutions; History of the City; How to see Chicago; City institutions; Federal buildings; Business blocks and buildings; Educational institutions; Amusement resorts and excursions; and all else that the Columbian Exposition visitor will need for reference.

GRASSES OF THE PACIFIC SLOPE. Including Alaska and the Adjacent Islands. Plates and Descriptions of the Grasses of California, Oregon, Washington, and the Northwestern Coast, including Alaska. Parts I. and II. By Dr. Geo. Vasey, Botanist, U. S. Department of Agriculture. Issued October 20, 1892 and June 1, 1893. Published by Authority of the Secretary of Agriculture. Washington, D. C., Government Printing Office. Numerous full page lithographed plates, quarto, paper.

This monograph is a monument to the careful researches of the late Dr. Vasey. About 200 species of grasses are known to grow on the Pacific slope of the United States. These are all specifically distinct from the grasses growing east of the Mississippi, and are mainly distinct from the grasses of the North American plains and deserts.

NORTH AMERICAN BIRDS. By H. Nehrling. With 36 colored plates after water-color drawings by Prof. Robert Ridgway, Smithsonian Institution, Washington, D. C.; Prof. A. Goering, Leipzig; and Gustav Muetzel, Berlin. Milwaukee: George Brumder. 1893. Volume I. 371 pp., il., redlined quarto, Morocco Gilt.

No efforts have been spared to further the excellence of this most valuable treatise on North American Birds. The type is large and clear, and the finest book-paper adds a charm to the letter press which has been well written. No other region on the globe can boast of so large a variety of pleasing birds as the United States, and American lovers of outdoors will find this book to their taste. Sold by Orange Judd Company. Price, postpaid, $1 per part, $15 complete.

SHELBURNE FARMS STUD of English Hackneys, Harness and Saddle Horses, Ponies and Trotters. By Wm. Seward Webb. Illustrated. New York and London: G. P. Putnam's Sons. 1893. 98 pages letter press, 16 full page views, large quarto, cloth.

Dr. Wm. Seward Webb, owner of the Shelburne Farms at Shelburne, Chittenden Co., Vt., has issued this magnificent catalogue of his thoroughbred horses. There is a full description of the farm and breeding establishment, with very artistic phototype, full page views of the beautiful Hackneys, and their home and landscape surroundings.

THE TURKEY: Its Characteristics, Varieties and Management. By Wm. Willis-Harris, Vice President of the Turkey Club. Published by the Author: Fern Lodge, Pulboro', Sussex, England. Second Edition, 1893. 90 pp., 16mo., paper.

During the two years which have elapsed since the first edition of this useful little book was published, it transpired that there was an unthought of number of turkey breeders, and the first edition was exhausted in so short time that it was clearly shown that an authentic monograph on the turkey was required by many poultry keepers and farmers. The larger part of the book has been rewritten, and a chapter describing the varieties and their standards for judging, has been added. The treatment of diseases and remedies has been much extended. Sold by Orange Judd Company. Price, postpaid, fifty cents.

COUNTRY ROADS. Expert Opinions Upon Laying Out, Construction and Maintenance. Edited by Edwin C. Powell, Ass't Editor American Gardening. Illustrated. New York: Rural Publishing Co. 1893. 66 pp., il., 12 mo., paper.

The deep interest in the improvement of the public highways has prompted the issue of this useful work, which contains chapters as follows: How to construct cheap and durable highways, by Professor I. P. Roberts of Cornell University. A talk on highway laws and their application, by J. M. Olin of Wisconsin. Road making and management by James Bradford Olcott of Massachusetts. Highway management is discussed by the editor. The treatise is thorough and practical throughout. Sold by Orange Judd Company. Price, postpaid, 20 cents.

AMERICAN SHROPSHIRE SHEEP RECORD. Vol. VIII. Published by the American Registry Association. Edited and Compiled by the Secretary. 1893. 1404 pp., frontispiece, 8 vo; half-Russia. Price to non-members, $2.50. Sold by Mortimer Levering, Secretary, Lafayette, Indiana.

This magnificent volume contains Shropshire sheep pedigrees from No. 32,249 to No. 44,505. There are, also, lists of members, owners, breeders and importers; indexes to rams and ewes; the pedigree numbers of the sheep reported dead, and a list of transfers. The editing has been accurately and thoughtfully done. The typography and binding are unexcelled, and the work is a model book of reference.

WASHINGTON STATE BOARD OF HORTICULTURE. First Biennial Report, containing the Proceedings of the Board, Abstracts of Reports of its Officers and Members, and Supplements. Edited by the Secretary, C. A. Tonneson, Seattle, Wash. State Printing House: Olympia. 1893. 304 pp., il., 8 vo., cloth.

This creditable first Report of the Horticultural Society of the new State of Washington, contains articles on Injurious insects and remedies; Varieties of fruits best adapted to Washington State; Growing cabbage, cauliflower and other seeds; Hop industry; Plant food and fertilizers; Horticulture aided by irrigation; Seed tables, ages for fruit bearing and yields; and other useful articles on Grafting waxes and Fruit boxes.

Recent Publications.

MISCELLANEOUS WORKS.

GOOD ROADS. An illustrated monthly magazine devoted to the improvement of the public roads and streets. Isaac B. Potter, Managing Editor. League Roads Improvement Bureau, Potter Building, New York. $2 per year.

FARM STATISTICS. Bureau of Industries, Ontario Department of Agriculture. C. C. James, Sec'y, Toronto, Canada.

CONSULAR REPORT 153. Agriculture, Trade and Commerce in Foreign Countries. 256 pp. 8 vo., paper. Department of State, Washington, D. C.

ZOOLOGICAL SOCIETY OF PHILADELPHIA. Twenty-first Annual Report. Prof. Henry C. Chapman, Corresponding Sec'y. Progress of the Zoological Garden, Fairmount Park, Philadelphia.

SALT in Relation to Agricultural Depression. Leaflet. The Salt Union, Limited, London.

STUDENT'S EXPENSES. A number of lists of expenses of different classes of students at Harvard University. Sent free by addressing Secretary Frank Bolles, Harvard University, Cambridge, Mass.

AMERICAN SOUTHDOWN BREEDERS' ASSOCIATION. Proceedings of the Twelfth Annual Meeting. S. E. Prather, Sec'y, Springfield, Ill.

MASSACHUSETTS PUBLIC RESERVATIONS. Second Annual Report. Parks and Open Spaces. Charles Eliot, Sec'y, Brookline, Mass.

THE SCHOOL REVIEW. A Journal of Secondary Education. Edited by J. G. Schurman and C. H. Thurber. Cornell University, Ithaca, N. Y. Monthly. $1.50 per year.

TRAVELING LIBRARIES. University of the State of New York, Public Libraries Department of State Library. List of Best Books on Agriculture. Melvil Dewey, Director, Albany, N. Y.

ONTARIO DAIRYMEN'S AND CREAMERIES' ASSOCIATIONS. Annual Reports for 1892. Secretaries:

OUR LIBRARY CORNER.

Harford Ashley, Belleville; John Hannah, Seaforth; J. W. Wheaton, London, Canada.

AGRICULTURAL EXPERIMENT STATION BULLETINS.

ALABAMA—At Auburn. Eye diseases of domestic animals (B. 43). Tobacco (B. 44).

ARKANSAS—At Fayetteville. Cotton (B. 23).

IDAHO—At Moscow. Chemistry and the agricultural development of Idaho (B. 3).

INDIANA—At Lafayette. Dairy experiments (B. 44).

IOWA—At Ames. Steer feeding; Sugar beets; Machinery and methods of spraying; Grass and leaf hoppers; Fungus diseases; Treatment of spot diseases of the cherry and currants, and potato blight; Prevention of corn and oat smut; Experiments with mullein; Rainfall record (B. 20).

MASSACHUSETTS—At Amherst. Weather (B. 47). Fertilizers (S. B. '93).

MINNESOTA—At St. Anthony Park. Classification of insects and their relation to agriculture (B. 28).

NEW HAMPSHIRE—At Durham. Agriculture (R. '90-'92).

NEW YORK—At Geneva. Experiments in the manufacture of cheese (B. 54). General principles relating to the composition and use of fertilizers (B. 55). Cornell, at Ithaca. Cost of milk production; Variation in individual cows (B. 52). Œdema of the tomato (B. 53).

NORTH CAROLINA—At Raleigh. Analyses of tobacco cured by the leaf-cure on wire and the stalk process (B. 90 a). Analyses of some native North Carolina grasses, forage plants, grains, seeds and by-products (B. 90 b). Experiments in wheat culture; Thunder storm observations in North Carolina (B. 91). Weather (B. 91 a).

OREGON—At Corvallis. Drainage (B. 26).

SOUTH DAKOTA—At Brookings. Plants injurious to stock (B. 33).

TENNESSEE—At Knoxville. Experiments (R. '90-'92).

TEXAS—At College Station. Cost of cotton production and profit per acre (B. 26).

VERMONT—At Burlington. Feeding tests with sugar meal, cream gluten meal and germ feed (B. 31). Record of the station herd for the year (B. 33). Analyses of fertilizers licensed for sale in the state (B. 34-35).

WASHINGTON—At Bullman. Horticultural information (B. 6).

WEST VIRGINIA—At Morgantown. Catalogue of West Virginia Scobytidæ and their enemies (B. 31).

WYOMING—At Laramie. Feeding and management of cattle (B. 13).

AUSTRALIA—At Brisbane. Wheat culture in Queensland (B. 22).

CANADA—At Guelph. Fodder corn (B. 89). At Toronto. Crops and live stock in Ontario (B. 45).

UNITED STATES GOVERNMENT PUBLICATIONS.

UNITED STATES DEPARTMENT OF AGRICULTURE, Washington, D. C.—Report of the Statistician; Crop report; agriculture in the Caucasus; the customs tariff in Martinique; agricultural produce statistics of the United Kingdom; transportation rates (S. R. 105). Synopsis issued in advance of the monthly report of the Statistician, from which it is condensed. The Journal of Mycology (VII, 3): Devoted especially to the study of fungi in their relation to plant diseases; contains articles on experimental treatments of rusts of wheat and other cereals, peach rosette, remedies for the almond disease, and prevention of leaf diseases of nursery stock. The rape plant: Its history, culture, and uses (F. B. 11). Nostrums for increasing the yield of butter (F. B. 12). Forest influences: Summary of conclusions; review of forest meteorological observations; relation of forests to water supplies; notes on the sanitary significance of forests; and appendix, including articles on the determination of precipitation and its bearing on theories of forest influences, and on the analysis of rainfall with relation to surface conditions (F. B. 7). Reports of observations and experiments in the practical work of the division of entomology: Beneficial and injurious insects of California; insect injuries in Nebraska during the summer of 1892; insects of the season in Iowa; entomological notes; experiments in apiculture (E. B. 30). Organization lists of the agricultural Experiment stations and agricultural schools and colleges in the United States: A list of the experiment stations, with their governing boards and station staffs; and also of the agricultural schools and colleges, with their courses of study and boards of instruction (E. S. B. 13). Studies of parasitic and predaceous insects in New Zealand, Australia, and adjacent islands, made at the request of the California state board of horticulture. Monthly weather review throughout the United States. Experiment Station Record, (IV. 8): Editorial note,—Two factors often disregarded in the purchase of feeding stuffs; conclusion of Dr. Wolny's article, Relation of the physical properties of the soil to the cultivation of plants; abstracts of publications of the agricultural experiment stations in the United States, and of reports of foreign investigations. Timber physics, Part 2; progress report: Results of investigations on long-leaf pine; Mechanical tests at Washington University testing laboratory, St. Louis, Mo.; the long-leaf pine, its characteristics and distribution; results of mechanical tests; field report regarding turpentine timber; resinous contents and their distribution in the long-leaf pine; field records of test material (F. B. 8). Reprints in small editions from the report of the Secretary of Agriculture of the reports of the Assistant Secretary of Agriculture, the Chief of the Bureau of Animal Industry, the Chief of the Division of Chemistry, the Botanist, the Pomologist, the Microscopist, the Special Agent in charge of fiber investigations, the Superintendent of Gardens and Grounds, the Statistician, the Chief of the Division of Records and Editing, and the Director of the Office of Experiment Stations.

CATALOGUES ACKNOWLEDGED.

COLUMBIAN HARNESS CO., Rochester, N. Y.: Illustrated and descriptive catalogue of fine handmade harness and harness saddlery.

GERMAN KALI WORKS, 93 Nassau St., New York City: A complete list of important products of the Strassfurt Mines and all chemicals manufactured from them, together with a descriptive list of potash salts used in agriculture in the United States.

P. C. LEWIS MFG. CO., Catskill, N. Y.: Illustrated catalogue of spraying pumps, agricultural and veterinary syringes, and spraying outfits for orchard, field, and garden.

MINARD HARDER, Empire Agricultural Works, Cobleskill, N. Y.: Illustrated and descriptive catalogue of the Smalley ensilage and fodder cutters—a clear and concisely written description of ensilage and fodder cutting giving practical views of practical men, all of whom unite in praising the ensilage machinery sent out by this firm.

PITCHER & MANDA, Short Hills, N. J.: Floral Treasures. An elegant and artistically illustrated pamphlet, describing some of the attractions of the far-famed United States nurseries.

KEYSTONE MANUFACTURING CO., Sterling, Ills.: Descriptive and illustrated catalogue of the Keystone Corn Husker and Fodder Cutter-machines, which are rapidly making their way everywhere where corn is grown.

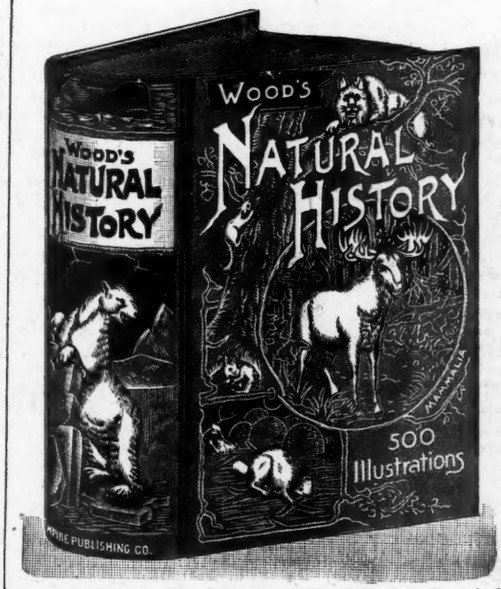
A. I. ROOT, Medina, O.: Illustrated catalogue of beekeepers' supplies of every kind and description.

G. C. WATSON, 1025 Arch St., Philadelphia, Pa.: Circular of Watson's Prolific genuine English Mushroom Spawn. This brand is guaranteed fresh and full spawned.

BALING PRESSES
ALL KINDS.
HORSE AND STEAM POWER.
Address Manuf'rs.
COLLINS PLOW CO.
No. 13 QUINCY, ILL

WOOD'S NATURAL HISTORY
AND THE
American Agriculturist One Year
FOR ONLY $2.00.
Given for 2 New Subscribers.

CONTAINS 500 ILLUSTRATIONS AND 800 PAGES.



Wood's Natural History, with its charming descriptions and delightful anecdotes of all animals, both domestic and wild, is the greatest authority in the land.

It gives minutely, and in the simplest language the habits, haunts, diseases and peculiarities of the entire animal kingdom. This great work is by the world-famous naturalist, the Rev. J. G. Wood, M. A., F. L. S., author of several other celebrated works on animal life, but none with so great a fund of information as this great work, now published for the first time in America. The clear and descriptive text of the writer is **embellished with 500 engravings** by such eminent European artists as Wolf, Weir, Zwecker, Coleman, Harvey and others.

No library is complete without this famous work. It is impossible to give in this announcement more than a slight idea of the magnitude of this great history, with its many pictures and accurate descriptions. It virtually goes into the haunts of all animals and shows them as they live. Wood's Natural History is **the recognized authority** all over the world for accurate information regarding the habits, haunts, peculiarities and diseases of the animal kingdom. The work is a veritable treasure-house of valuable information, interestingly told, and replete with hundreds of accurate and artistic illustrations.

Every lover of nature will be delighted with the information imparted in its pages. Thousands of the descriptions of the animals, both domestic and wild, and accompanied with anecdotes relative to the species, with hundreds of vivid pictures, illustrating them true to life. These engravings give a clear idea of what the animals of the world really are, where they roam, and how they live. The author gave years of his life to the compilation of the facts contained in this great volume, and was assisted by many of the leading naturalists of the world.

This mammoth cyclopedia of the animal world consists of over 800 pages and is bound luxuriously. The binding is in fine cloth, and is embossed in silver and brown ink from a new and original design. It contains 800 pages of clear print on good paper, with 500 excellent illustrations, and until this new edition was printed never sold for less than $5.

Our price **$1.50**, with the AMERICAN AGRICULTURIST one year **$2.00**, postpaid.

ADDRESS

AMERICAN AGRICULTURIST,
52 and 54 Lafayette Place, - - - New York.

Profusely Illustrated.

JUST PUBLISHED.

BULBS AND Tuberous-Rooted PLANTS

—THEIR—

History, Description, Methods of Propagation, and Complete Directions for Their Successful Culture in the Garden, Dwelling and Greenhouse.

BY C. L. ALLEN.

Hyacinths

Lilies

Tulips

Narcissus

Cyclamen

Callas

Gladiolus

Amaryllis

Freesia

Tropæolum

Tigridias

Etc., Etc.

THE DEMAND for a book describing in as trustworthy manner how to grow Bulbs and Tuberous-Rooted Plants in the open ground, as well as in the greenhouse and window garden; how to propagate them; how to succeed and avoid failure, has long been urgent. No other class of plants occupies so important a place in the field of floriculture as do the various kinds of flowering bulbs, and is at the same time so little understood. The amount of money annually expended for bulbs is more than is paid for any other class of flowering plants.

As generally treated, bulbs are an expensive luxury, while, when properly managed, they afford the greatest amount of pleasure at the least cost.

The author of this book has for many years made bulb growing a specialty, and is a recognized authority on their cultivation and management. He has taken the initiative in this country to make bulb growing a special industry, and therefore writes from his own long and extensive experience.

The Illustrations

which embellish this work have been drawn from nature, and have been engraved expressly for this book. The cultural directions are plainly stated, practical, and to the point. Mr. Allen renounces the idea that it is difficult to successfully raise flowering bulbs, and shows that their necessary requirements are simple and few. What not to grow forms an important feature in this book, which is of especial value to many beginners who usually undertake to grow many kinds which even the professional florist could not accomplish in a satisfactory manner, under existing conditions. The method of using a special soil for each kind of plants,—as is frequently recommended,— has discouraged many flower lovers from growing bulbs.

This erroneous idea is so plainly exposed that many persons who read this book will again become encouraged to undertake what they had hitherto thought impossible to accomplish.

The Losses of Bulbs

from overestimating their hardiness are clearly recounted, and the simple remedies to prevent such losses are so plainly indicated and described that any one following these directions will suffer very little loss in the future. Some of the more important kinds of bulbs treated in the book are named in heavy faced type on this page.

Handsomely Illustrated, Cloth, 12mo. Price, postpaid, $2.00.

ORANGE JUDD CO., 52 and 54 Lafayette Place, New York.

= = = STANDARD RURAL BOOKS. = = =

To Purchaser of any One or More of these books: By adding $1 to the price of books, amounting to not less than $1, we will furnish the American Agriculturist one year all postpaid.

Flax Culture.
Full directions for preparation and marketing of crops 8vo. Illustrated.....30

Gregory on Fertilizers.
Where to get them in the Cheapest Form. How to Compound Formulas, etc. 12mo.....40

Henderson's Gardening for Profit.
By Peter Henderson. The standard work on Market and Family Gardening. Cloth, 12mo.....2.00

Henderson's Gardening for Pleasure.
Meets the wants of all classes, in country, city and village who keep a garden for their own enjoyment rather than for the sale of products. By Peter Henderson. Finely illustrated. Cloth, 12mo.....2.00

Quinn's Money in the Garden.
By P. T. Quinn. The kitchen garden, market garden, and field culture, from successful practical experience. Illustrated. Cloth, 12mo.....1.50

E. P. Roe's Play and Profit in My Garden.
The author takes us to his garden and shows us how he evoked a profit of $1,000 while carrying on pastoral and literary labor. Cloth, 12mo.....1.50

Treat's Injurious Insects of the Farm and Garden. By Mrs. Mary Treat.
With an additional Chapter on Beneficial Insects. Illustrated. Cloth, 12mo.....2.00

Johnson's How Crops Grow.
A Treatise on the Chemical Composition, Structure and Life of the Plant. By Prof. Samuel W. Johnson of Yale College. Illustrated. Cloth, 12mo.....2.00

Johnson's How Crops Feed.
A Treatise on the Atmosphere, the Soil and the Nutrition of Agricultural Plants. By Prof. Samuel W. Johnson. Illustrated. Cloth, 12mo.....2.00

Asparagus Culture.
The Best Methods. By James Barnes and William Robinson.....50

Broom Corn and Brooms.
Raising Broom-Corn and Making Brooms on a Small or Large Scale. Illustrated. 12mo. Cloth.....50

Gregory on Cabbages; How to Grow Them.
A Practical treatise on Cabbage Culture, giving full details. By Jas. J. H. Gregory. 12mo.....30

Gregory on Carrots, Beets, Turnips, etc.
How to raise roots, how to keep them, and how to feed them. By J. J. H. Gregory. Paper cover, 12mo.....30

Cauliflowers and How to Grow Them.
Plain, Practical and Explicit Directions for Cultivation, Management and Marketing. By Francis Brill.....20

Waring's Draining for Profit and Health.
The directions are plain and easily followed, and land drainage may be greatly improved, even to the banishment of fever and ague, typhoid and malarial fever. By Geo. E. Waring, Jr. Illustrated. Cloth, 12mo.....1.50

Allen's New American Farm Book.
The very best work on the subject. By Richard L. Allen. Revised and greatly enlarged by Lewis F. Allen. Cloth, 12mo. Illustrated.....2.50

Our Farm of Four Acres, and the money we made by it.
Many useful suggestions with the interest of a romance. Paper cover, 12mo.....30

Fuller's Practical Forestry.
Propagation, Planting and Cultivation, with a description and the botanical and proper names of Evergreen and Deciduous, and a number of the most valuable Exotic Species. By Andrew S. Fuller. Illustrated. Cloth.....1.50

How to Plant and What to Do with the Crops.
Valuable hints for the Farm, Garden and Orchard. By Mark W. Johnson. Illustrated.....50

Hop Culture.
Plain directions. Edited by A. S. Fuller. Forty engravings.....30

Sweet Potato Culture.
Full instructions from starting the plants to harvesting and storing the crop. With a chapter on the Chinese Yam. By James Fitz. Cloth, 12mo.....60

Insects and Insecticides.
Noxious Insects and Methods of Preventing their Injuries. By Clarence M. Weed, D. Sc., New Hampshire. College of Agriculture. Illustrated. Cloth, 8vo.....1.25

Dadd's American Cattle Doctor.
By George H. Dadd, M. D. The necessary information for preserving the health and curing the disease of oxen, cows, sheep and swine. Cloth, 12mo.....1.50

Allen's American Cattle.
Their History, Breeding, and Management. By Lewis F. Allen. Illustrated. Cloth, 12mo.....2.50

The New Onion Culture.
By B. T. Grenier. Valuable to every one who raises onions. 12mo.....50

Onions: How to Raise them Profitably.
Practical Details by Seventeen Onion Growers. 8vo...20

Gregory on Onion Raising.
What kinds to raise, and the way to raise them. By J. J. H. Gregory. Paper, 12mo.....30

Jones' Peanut Plant; Its Cultivation and Uses.
Instructing the beginner how to raise good crops of Peanuts. By B. W. Jones.....50

The A B C of Potato Culture.
By W. B. Terry. Latest improvements in this branch of agriculture.....40

Potato Pests.
The most complete account of the Colorado Beetle. By Prof. C. V. Riley.....50

Silos, Ensilage, and Silage.
A practical Treatise containing authentic information. By Manly Miles, M. D., F. R. M. S. Illustrated. Cloth, 12mo.....50

Gregory on Squashes.
A Treatise which no Farmer or Gardener ought to be without. By J. J. H. Gregory. 12mo.....30

Tobacco Culture: Full Practical Details.
Full details of every process by Fourteen Tobacco Growers. Illustrations. 8vo.....25

Truck Farming at the South.
Essential to any one who contemplates entering this promising field of Agriculture. By A. Oemler of Georgia. Illustrated, cloth, 12mo.....1.50

Wheat Culture.
How to double the yield and increase the profits. By D. S. Curtiss, Washington, D. C. Illustrated. 12mo...50

Bailey's Field Notes on Apple Culture.
By Prof. L. H. Bailey, Jr. A useful and thoroughly practical book. Cloth, 12mo.....75

The Cider Maker's Handbook.
A complete guide for making and keeping pure cider. By J. M. Trowbridge. Illustrated. Cloth, 12mo....1.00

White's Cranberry Culture.
By Joseph J. White, a practical grower. Illustrated. Cloth, 12mo.....1.25

Henderson's Practical Floriculture.
By Peter Henderson. A guide to the successful propagation and cultivation of florists' plants. Beautifully illustrated. New and enlarged edition. Cloth, 12mo..1.50

Barry's Fruit Garden.
By P. Barry. A standard work on fruit and fruit trees. New edition revised up to date. Indispensable to all fruit growers. Illustrated. Cloth, 12mo.....2.00

Husmann's American Grape-Growing and Wine Making.
By George Husmann of California. A recognized authority on the subject. Illustrated. Cloth, 12mo...1.50

Fuller's Grape Culturist.
By A. S. Fuller. Best work on the culture of the hardy grapes. Illustrated. Cloth, 12mo.....1.50

Your Plants.
Plain and Practical Directions for the Treatment of Tender and Hardy Plants in the House and in the Garden. By James Sheehan.....40

Henderson's Handbook of Plants.
A concise dictionary of plants, with instructions on propagation and culture. Cloth, large 8vo.....4.00

The Propagation of Plants.
By Andrew S. Fuller. Describing the process of hybridizing and crossing. Illustrated. Cloth, 12mo..1.50

Fulton's Peach Culture.
The only practical guide to Peach Culture for those who would be successful. By Hon. J. Alexander Fulton. Cloth, 12mo.....1.50

Quinn's Pear Culture for Profit.
How to raise Pears. By P. T. Quinn. Cloth 12mo...1.00

Quince Culture.
By W. W. Meech. Propagation and cultivation, insect enemies, diseases and remedies. Illustrated. Cloth, 12mo.....1.00

Parsons on the Rose.
By Samuel B. Parsons. The propagation, culture and history of the rose. Illustrated. Cloth, 12mo.....1.00

Fuller's Small Fruit Culturist.
By Andrew S. Fuller. The book covers the whole ground of small fruits. Illustrated. Cloth, 12mo.....1.50

Strawberry Culturist.
By Andrew S. Fuller. All information necessary to raise strawberries. Illustrated. Cloth, 12mo.....25

Heinrich's Window Flower Garden.
Personal experiences in Window Gardening. By Julius J. Heinrich. Fully illustrated. Cloth. 12mo.....75

Concerning Lawn Planting.
By Calvert Vaux and Samuel Parsons, Jr. Advancing the standard of Landscape Architecture.....25

Long's Ornamental Gardening for Americans.
Beautifying Homes, Rural Districts and Cemeteries. By Elias A. Long, Landscape Architect. Illustrated. Cloth, 12mo.....2.00

The Dairyman's Manual.
By Henry Stewart. A useful and practical work. Illustrated. Cloth, 12mo.....2.00

Hog-Raising and Pork-Making.
By Rufus Bacon Martin. Valuable suggestions for the business of hog-raising. Paper, 12mo.....40

Stewart's Shepherd's Manual.
It is so plain that one who has never kept sheep, may learn from its pages how to manage a flock successfully. By Henry Stewart. Illustrated.....1.50

Harris on the Pig.
Equally valuable to the farmer who keeps but few pigs, and to the breeder on an extensive scale. By Joseph Harris. Illustrated. Cloth, 12mo.....1.50

The Dogs of Great Britain, America and Other Countries.
Breeding, Training and Management, in Health and Disease. By "Stonehenge." Illustrated. Cloth, 12mo..2.00

Herbert's Hints to Horse-Keepers.
A Complete Manual for Horsemen. By William Herbert (Frank Forester). Illustrated. Cloth, 12mo.....1.75

Sander's Horse Breeding.
The principal of Heredity applied to the business of breeding animals. By J. H. Sanders. Cloth, 12mo...2.00

Quinby's New Bee-Keeping.
The Mysteries of Bee-Keeping Explained. Cloth, 12mo.....1.50

Duck Culture.
Natural and Artifical. By James Rankin. Fully illustrated.....50

Stoddard's An Egg Farm.
By H. H. Stoddard. The management of poultry in large numbers. Illustrated. 12mo. Cloth.....50

Profits in Poultry.
Useful and Ornamental Breeds and their Profitable Management. Illustrated. Cloth, 12mo.....1.00

Canning and Preserving.
By Mrs. S. T. Rorer. Teaching beginners how to can and preserve fruits and vegetables, making marmalades, fruit, butter and jellies, drying fruits and making syrups and catsups, pickling, flavored vinegars, drying herbs, etc.....50

Barn Plans and Outbuildings.
Full of Ideas, Hints, Suggestions and Plans for the Construction of Barns and Outbuildings. Illustrated. Cloth, 12mo.....1.50

Laws' Veterinary Adviser.
A guide to the Prevention and Treatment of Disease in Domestic Animals. By Prof. James Law. Cloth. Crown, 8vo.....3.00

Stewart's Feeding Animals.
By Elliott W. Stewart. The laws of Animal growth, specially applied to rearing and feeding. Illustrated. Cloth, 12mo.....2.00

The American Standard of Perfection.
The recognized standard work on Poultry.....1.00

The Practical Fruit Grower.
By S. T. Maynard. Just what the beginner needs and the successful fruitman practices. Illustrated. Cloth..50

The Family Horse.
By Geo. A. Martin. A practical Manual, full of the most useful information. Illustrated. Cloth, 12mo.....1.00

Stewart's Irrigation for the Farm, Garden, and Orchard.
Farmers can readily appreciate the losses which result from the scarcity of water By Henry Stewart. Illustrated. Cloth, 12mo.....1.50

Mushrooms, How to Grow Them.
The most practical work on the subject and the only book on growing Mushrooms published in America. By Wm. Falconer. Illustrated. Cloth.....1.50

Harris's Talks on Manures.
By Joseph Harris, M. S., author of "Walks and Talks on the Farm," including a chapter by Sir John B. Lawes, of Rothamsted, England. Cloth, 12mo.....1.75

Bommer's Method of Making Manures.
A practical and comprehensive guide. By Geo. Bommer. Paper.....25

High Farming Without Manures.
By George M. Ville. Six Lectures at the Experimental Farm at Vincennes.....25

Keeping One Cow.
A collection of Prize Essays upon the management of a single Milch Cow. Illustrated. Cloth, 12mo.....1.00

SENT FREE. **New Edition of Illustrated Rural Book Catalogue, containing 116 pages, and fully describing upwards of 600 valuable works on Agriculture, Horticulture, Architecture, Horses, Cattle, Game, etc.**

Address

ORANGE JUDD CO., 52 & 54 Lafayette Place, New York.

American Farming And Stock Raising.

REVISED EDITION.

Edited by CHAS. L. FLINT. - Revised and Enlarged by PROF. MANLY MILES.

Adapted to all sections, East, West, North and South. A work indispensable to the Farmer, the Breeder of Live Stock, the Stock Fancier, Fruit Grower, Gardener, Apiarist, Architect of Farm Buildings, as well as to the Housekeeper.

Illustrated with over 700 Engravings. - Two Hundred Full Page Plates.

Published in three large quarto vols., with over 2,100 pages.

Treats of **Soils, Fertilizers, Tillage, What Crops to Raise, Rotation of Crops, Irrigation, Drainage, Grasses and Forage Plants, Cereals, Roots and Esculent Tubers, Cotton, Sugar, Tobacco, Fruits, Ensilage, Good Seed, Timber Culture, Water Supply of the Farm, Motive Power for Farms, Farm Teams, Roads and Road Making, Farm Roads, Farm Fences, Wastes and Wants of the Farm, Choice of Farms, Model Farms, Large Farms of the Country, Farm Buildings, the Dairy;** the description of all kinds and breeds of **Farm Stock, their Diseases** and treatment, including the **Horse, Ass, Mule, Cattle, Sheep, Goats Alpacas, Swine,** the principles of Breeding; **Poultry,** giving a description of over one hundred and twenty varieties of land and water fowls, comprising **Hens, Turkeys, Ducks, Geese, Guinea Fowls, Pigeons. Pheasants,** etc.; **Dogs,** useful to the farmer; **Bees** and their management; **Fish Culture, Silk Culture, Agricultural Uses of Birds; Insect Enemies, and Diseases of Farm Crops, Improved Farm Implements, Business Principles of Farm Management; Proper Sanitary Condition of Homes, Methods of Improvement in the Household, Valuable Tables, Recipes and Suggestions.**

Each Department being equal to a Distinct Volume on the subject treated.

The Illustrations of Domestic Animals

In this work are not like those in many Agricultural books, ideal representations, but are faithful copies of the photographs of LIVING ANIMALS selected from specimens of the

CHOICEST THOROUGHBRED STOCK OF AMERICA.

And hence are correct types of the several breeds to which they belong.

The late MR. FLINT'S reputation as an agricultural writer is not only national, but world-wide. The entire work has been carefully revised and in all respects brought down to the present day by PROF. MANLY MILES.

WILLIAM H. BREWER, PH. D., *Professor of Agriculture in Yale University.*

I have examined AMERICAN FARMING, by Charles L. Flint, and heartily commend the work.

PROF. B. F. KOONS, *Pres. Storrs Agricultural College, Mansfield, Ct.*

AMERICAN FARMING has given universal satisfaction among our students and all who have access to it. No other work has done more general good service, or been more useful.

Letter from SIR JOHN B. LAWES, *Agricultural Experiment Station, Rothamstead, England.*

DEAR SIRS:—Many thanks for a copy of AMERICAN FARMING, which you have so kindly sent me. I was delayed writing for a time to make myself acquainted with the work, and I have much pleasure in expressing my opinion, which you are at liberty to publish, if you so desire. You have produced a work of great utility. It contains in itself a complete library of valuable information upon all subjects connected with rural economy, and the plates are very well executed.

Yours truly, J. B. LAWES.

American Farming and Stock Raising

Contains over 2,100 quarto pages, is issued in three volumes, elegantly and substantially bound.

Fine Pebbled Cloth, Black and Gold Ornaments, Red Edges, Three Volumes, Per Volume, $3.00.

The Set Complete in Three Volumes, weighing 15 pounds, securely packed, sent by express, charges paid, on receipt of **$9.00.** In addition we include the AMERICAN AGRICULTURIST one year.

EVAPORATE YOUR FRUIT AT HOME,

WITH THE

U.S. Cook Stove Drier

Hundreds of Dollars' Worth of Fruit Can be Saved with this Machine Every Year.

To meet the demand for a small, cheap Drier, suitable for use on any ordinary cook, oil or gasoline stove, we now offer the above. It is very simple, economical, efficient and convenient, and for farmers' use just what is wanted, and we believe THE CHEAPEST AND BEST LITTLE DRIER of its class ON THE MARKET.

This shows the Drier set on an ordinary Cook-Stove.

$8.50 IN VALUE FOR $5.00.

Through a special arrangement we are enabled to offer the U. S. Cook Stove Drier, the regular price of which is $7, for only $5, together with a year's subscription to the AMERICAN AGRICULTURIST (regular price $1.50.)

To any one sending a club of 6 new yearly subscribers to the AMERICAN AGRICULTURIST at $1 each, or 3 new yearly subscribers and $2 in money, we will send one of the Driers FREE.

This Drier has Eight Galvanized Wire Cloth Trays, containing 12 square feet of tray surface. The dimensions, base 22x16 inches, height 26 inches. Sent by freight at receiver's expense. Weight, crated, about 27 pounds.

It is always ready for use and will **last a lifetime.** Has been **thoroughly tested and approved,** and will more than please you. As a **great economizer** and **money maker** for **Rural People,** it is **without a rival.**

With it, you can, at **odd times, summer or winter, evaporate** enough **wasting fruit,** etc., **for family use,** and enough to **sell** or **exchange** for **all** or the **greater part** of your **groceries,** and in fact, **household expenses. No labor** on the farm **will pay better,** or as well, as that of **converting** your **wasting fruits** into **evaporated stock.** The apples, pears, plums, etc., if evaporated, will sell or exchange pound for pound for butter, granulated sugar, or most groceries, while evaporated cherries, raspberries or peaches, bring good price. **If you have even only a few trees** in your yard or town lot one of the U. S. Cook Stove Driers will **enable you** at **odd hours** to **evaporate enough fruit** for **family** use and enough to sell or exchange for the greater part of your groceries.

It is the Greatest Little Bread Winner on the Market.

Its capacity is ample for domestic use, being greater than **some machines** which sell for **fifteen or twenty dollars.** It is furnished with **heat-regulating damper** below the trays, which can be **instantly adjusted.** It is **always ready** for immediate use. The working of the machine on sundry fruits, berries, etc., satisfies us that it will happily **fill a want** our correspondents have urged upon us to supply.

SENT FREE. **New Edition of Illustrated Rural Book Catalogue,** containing 116 pages, and fully describing upwards of **600 valuable** works on **Agriculture, Horticulture, Architecture, Horses, Cattle, Game, etc.**

Address

ORANGE JUDD CO., 52 & 54 Lafayette Place, New York.

American Agriculturist French Achromatic Telescope

Given for 4 New Subscribers, or for 2 New Subscribers and $1.00.

FOR ONLY $3.00

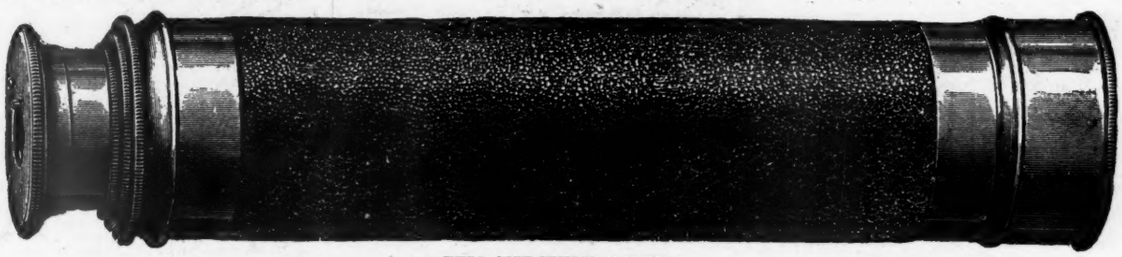
We will send one of these telescopes postpaid to any postoffice in the United States, and in addition will include with instrument

A YEAR'S SUBSCRIPTION FREE TO THE AMERICAN AGRICULTURIST.

For $4.00 we will send the Telescope postpaid and the American Agriculturist for two years, the Telescope and Subscription sent to separate addresses if desired.

This telescope is first-class in every respect and our subscribers testify that it is equal to other instruments that cost from $5 to $15 each.

High power achromatic telescopes have heretofore sold at prices placing them almost beyond reach of persons of moderate means. The telescope we now offer is just what the people want, a real philosophical instrument at a low cost. Farmers, Herdsmen, Hunters, Prospectors, Travelers, Tourists, and, in fact, everybody will find this instrument invaluable.



FULL SIZE WHEN CLOSED.

DESCRIPTION OF THE TELESCOPE

DIMENSIONS: The length of the telescope, when extended is 16½ inches; when closed, 6 inches; diameter, 1¼ inches.

Five Lenses. This useful and beautiful instrument has five lenses, of the best French manufacture. The object lenses are achromatic, that is, convex and concave, having different refractive and dispersive powers, with the curvatures so adjusted that the chromatic aberration produced by the one is corrected by the other, and light emerges from the compound lens undecomposed, or free from color, objects at a long distance appearing clear and natural.

Brass Slides. The slides and mountings are made of brass, highly polished, the telescope tubes fitting closely into each other.

Brass Safety Caps. Safety caps of polished brass cover the exposed ends of the instrument, keeping out dampness and dust when not in use.

Morocco Covered Tubes. The main tube or body of the telescope is covered with handsome French morocco, making it altogether a most excellent instrument.

EACH TELESCOPE is furnished in a strong cloth-covered case. It is strongly made and cannot get out of order, but will last a lifetime.

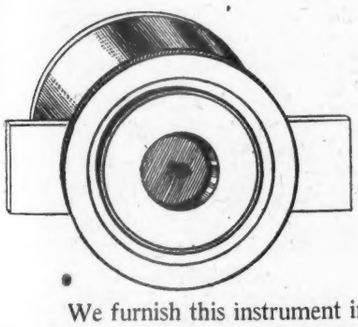
HOW FAR YOU CAN SEE WITH IT. If the atmosphere is clear you can see the time on a tower clock at a distance of five miles. A man who is one mile away will appear to be fifteen rods from you, and persons with whom you are familiar can be recognized at a distance of three or four miles. The moons of Jupiter can be seen with it. What are supposed to be mountains or extinct craters on the surface of the moon can be seen plainly with the glass.

There is not a man, woman or child, that cannot find use for such a glass almost every day of their lives. Many of our customers write us that they never had so much pleasure and enjoyment from a small investment as this telescope afforded them.

AMERICAN AGRICULTURIST

French Achromatic Telescope and Microscope

COMBINED.



This instrument combines all the excellent qualities of the Telescope described above, and owing to its special optical construction—those of a fine MICROSCOPE. The size and finish are the same as those of No. 224. The instrument can be used as a TELESCOPE, giving equal satisfaction. When closed it is in focus for microscopic work, and the objects are held in place by the cap, which is cut on opposite sides, so as to enable one to place the glass side with object directly in front of the object lens. An opening of about one-half inch diameter in the top of the cap throws the light on the object. Each instrument is accompanied by one prepared MICROSCOPIC OBJECT, for which a special pocket is provided in the telescope case. To examine any insect, leaf, or other transparent object, place it between two slips of glass and insert them in the side opening of the cap.

We furnish this instrument in connection with the AMERICAN AGRICULTURIST one year for only $3.50, or it is given for Five New Yearly Subscriptions at the Club Rate of $1.00 a year.

Full Directions How to Use the TELESCOPE Accompany Each Instrument.

ADDRESS,

THE AMERICAN AGRICULTURIST, 52 AND 54 LAFAYETTE PLACE, - - - - NEW YORK, N. Y.

Contents of this Number.

Agriculture in the Public Schools 482
Ants Infesting a Willow 483
Beans, Field, White, Profit in (Wm. J. Thomas) 447
Beet Sugar in Asia 482
BOYS AND GIRLS:
The Magenta Satin Frock (Isabel Gordon) 3 *Illustrations*.. 467
How Charlie and Nellie Escaped (S. H. Platt, M. D.).. 469
The Autobiography of a Tomato Worm (Prof. Clarence M. Weed) ..... 2 *Illustrations*.. 470
American Soubriquets 470
Why Ralph Threw the Rice 470
The Profit of Defeat (Lucy E. Keeler) 470
Storied Words 470
See God Dancing 470
John Duffer 471
Money Making for Boys (Velma Caldwell Melville).. 471
Answers to May Puzzles 471
Bread Fruit in the Tropics (Herbert Stanley Renton) *Illustrated*.. 453
Bushes and Trees, Support for ..... *Illustrated*.. 446
California Agricultural Lands 483
Calves, Weaning (Webb Donnell) 452
Chickens, Raising for Christmas (S. Beebe) 448
Churning, Cool, in the Morning 456
Clover Seed from First Crop (W. A. Graham) 452
Colts, Young, Feed for (D. Worcester) 452
Clematis, The (C. L. Allen) ..... *Illustrated*.. 461
Corn Crop, The, Feeding (Henry Stewart) 456
Crops of the World, The 484
Dairy Philosophy, Proverbial (George E. Newell) 444
Dairying, Summer, Clealy 450
Dairying, Summer, in Warm Latitudes (G. H. Turner) 3 *Illustrations*.. 459
Drain, Tile, The, Where Water Enters (L. D. Snook) *Illustrated*.. 446
Exposition, Columbian, The, Some Agricultural Features of (James K. Reeve) ..... *Illustrated*.. 457
Fairs, State, County and Others 488
Farmers of the Chinese Empire, The (Frank J. Wissner) 3 *Illustrations*.. 455
Florida, Agricultural Outlook in, The 486
Flower Garden, The, in Midsummer (Eben E. Rexford) 469
From Near and Far 472
Fruit and Corn House, Combined (L. B. Pierce) *Illustrated*.. 446
Gate, Cheapest, The ..... *Illustrated*.. 446
Greenhouses, Three-Quarter Span (L. R. Taft) 3 *Illustrations*.. 451
Health, Board of, National, A 482
HOUSEHOLD:
Canning Fruits and Vegetables (S. E. Wilcox) 462
Appropriate Parlor Ornaments (Helen M. Pratt) 462
Windows in Summer 462
Care of the Hands 462
In the Woman's Building at the Columbian Exposition (Euphemia Winans) ..... *Illustrated*.. 462
Keeping the Little Folks Well (Annie Hamilton Donnell) 463
Baby's Chamois Shoe ..... *Illustrated*.. 464
Match Holders ..... 2 *Illustrations*.. 464
Some Pansy Trifles (Dora Hamilton).. 3 *Illustrations*.. 464
For a Bridal Gift (Sister Gracious) 464
The Tulip Dress ..... *Illustrated*.. 464
Flower Sachets ..... *Illustrated*.. 464
The Bird's Garden (Grace Lyman) 464
For Midsummer Days 465
Seasonable Dishes 465
Sterilized Milk (May Silvers) 465
Little Savings in the Kitchen (Katherine B. Johnson) 465
Cuban Rustic Dance ..... *Full Page Music*.. 466
Horses, Work, Protecting from Flies (S. Yates) 452
Indians, St. Regis, The 485
Irrigation, Sun-Motor for, The 482
Library Corner, Our 490
Malay, Black-Breasted Red, The (H. S. Babcock) *Illustrated*.. 449
Matters of Business 486
Michigan, Central, Season in, The 481
Names of American States 471
OUR LITTLE FOLKS:
The Children Couldn't Agree 471
The Little Sharp-Shooters (Rose Mary Thorne) 471
Pastures, Preserving and Improving (George E. Newell) ..... 2 *Illustrations*.. 450
Pears Rotting at the Core 484
Poultry House, The, Enlarging ..... *Illustrated*.. 446
Poultry, Shade and Water for 448
Poultry Yard, The, Vermin Plague in (B. Butler) 448
Sheep, Suffolk, in Their Land and Ours (George W. Franklin) ..... *Illustrated*.. 445
Stock, Shade for 454
Sugar Industry, Louisiana, Side Lights on the 482
Tea Culture in the United States (Dr. Charles U. Shepard) ..... *Frontispiece and 2 Illustrations*.. 442
Teasel Culture (S. A. Little) ..... 4 *Illustrations*.. 447
Topics of the Times 482
Tulips for Winter Blooming 481
Underdrains, Flushing ..... *Illustrated*.. 451
Violet Growing for Amateurs 481
Watering Troughs, Roadside ..... 2 *Illustrations*.. 459
Weeds, To the Credit of (C. L. Hill) 458
Wheat, Yields of, in Europe and America (J. J. Willis).. 454
Wool, The, Must Be Fed (S. Henry) 444

ENSILAGE

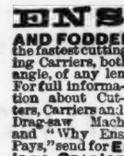
AND FODDER-CUTTERS of all sizes, the fastest cutting and best ever built, including Carriers, both straight and angle, of any length required. For full information about Cutters, Carriers and Drag-saw Machines, and "Why Ensilage Pays," send for **Ensilage Catalogue.** For the best Horse-powers, Threshers, Clover-hullers, Fanning-mills, Feed-mills, Circular-saw Machines, Land-rollers and Dog-powers, send for **Fearless Catalogue.**

Address, **MINARD HARDER,** Cobleskill, N. Y.

Farmers SEND YOUR Produce

To F. I. SAGE & SON, 183 Reade St., N. Y.,

Receivers of all kinds of COUNTRY PRODUCE, including Game, Live and Dressed Poultry and Dressed Calves. *Specialties*—Berries, Grapes, Apples, Pears, Honey, Onions and Potatoes. Correspondence and consignments solicited. Stencils furnished. Reference: Dun's or Bradstreets Commercial Reports, to be found at any bank.



WIFE SAYS SHE CANNOT SEE HOW YOU DO IT FOR THE MONEY. **$12** Buys a $65.00 Improved Oxford Singer Sewing Machine; perfect working, reliable, finely finished, adapted to light and heavy work, with a complete set of the latest improved attachments free. Each machine guaranteed for 5 years. Buy direct from our factory, and save dealers and agents profit. Send for FREE CATALOGUE.

OXFORD MFG. COMPANY, DEPT. D. 7. CHICAGO, ILL.

Pinless Clothes Line

WANTED—Salesmen to whom we will give EXCLUSIVE TERRITORY to sell our celebrated PINLESS CLOTHES LINE, the only line ever invented that holds clothes WITHOUT PINS—a wonderful success; or our famous FOUNTAIN INK ERASER which will erase ink instantly, and has NO EQUAL. The success of our salesmen shows the great demand for these articles, many making $20 to $30 per day. On receipt of 50c. will mail sample of either, or sample of both for $1, with price-lists and terms. PINLESS CLOTHES LINE CO., No. 202 Hermon Street, Worcester, Mass.

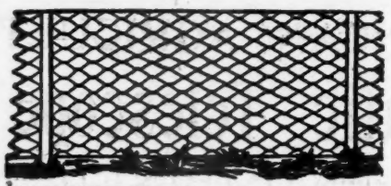
Fountain Ink Eraser

10 DAYS FREE TRIAL

in your own home. First-class Sewing Machines shipped anywhere to anyone in any quantity at wholesale prices. NO MONEY REQUIRED IN ADVANCE. We PAY the Freight.

$60 "Kenwood" $24.50
$55 "Kenwood" $22.50
$50 "Arlington" $20.50
$45 "Arlington" $18.50

27 other styles including Standard Singers at $9.50, $15.50, $17.50. Full set nickel plated attachments FREE. Latest improvements. Self-setting needle. Self-threading shuttle and automatic bobbin winder. Adapted for light and heavy work. Buy of the manufacturers and save agents and dealers large profits. Send at once for catalogue and testimonials free. Address (in full) CASH BUYERS' UNION, 158-164 W. Van Buren St., Dept. 16, Chicago, Ill.



BEST FARM FENCE, made of GALVANIZED STEEL WIRE. FENCES and GATES for all purposes. Write for free catalogue giving particulars and prices. Address

THE SEDGWICK BROS. CO., RICHMOND, IND.

Eastern Agents, STRAWBRIDGE & CHASE, All kinds Wire and Iron Work, 37 and 39 North 2d Street, Philadelphia, Pa.

POTATO DIGGER

—THE— 'HOOVER'

A 16-page pamphlet free. Mention this paper.

HOOVER & PROUT, Avery, Ohio.

When writing to advertisers be sure to mention the AMERICAN AGRICULTURIST.

AMERICAN AGRICULTURIST

—PUBLISHED BY THE—

ORANGE JUDD COMPANY.

A CORPORATION ORGANIZED UNDER THE LAWS OF THE STATE OF NEW YORK.

Main Offices, 52 and 54 Lafayette Place, New York, N. Y.

WESTERN OFFICE, 504 THE ROOKERY, CHICAGO, ILL.

The Western Office is for the accommodation of advertisers and subscribers in that section. All communications should be sent to the Main Office, New York.

Entered at New York Post office as mail matter of second class.

Terms of Subscription in the United States and British Provinces.

The American Agriculturist is published monthly and is mailed in time to reach subscribers on or before the first of each month.

Terms.—Single subscriptions $1.50 per year or 75 cents for six months, payable in advance. Clubs of five or more $1.00 per year, or 50 cents for six months.

A FREE copy for every club of five for either term.

Remittances.—Money for subscriptions can be sent by postal note, express or post-office money order, registered letter, check or draft; postage stamps accepted for fractional parts of a dollar.

Expiration of Subscriptions.—The date (usually abbreviated) following each subscriber's name which appears on the magazine or wrapper shows to what time your subscription has been paid. Thus: Jan. '93, means that subscription is paid up to January 1, 1893; Feb. '93, to February 1, 1893, and so on.

Renewals.—Six weeks are required after sending money before the date which shows to what time subscription is paid, and which answers for a receipt can be changed. No other receipt is sent unless requested. If at the end of six weeks date is unchanged or any error is noticed subscribers will confer a favor by notifying us.

Discontinuances.—Responsible subscribers will continue to receive this magazine until the publishers are notified by letter to discontinue, when all arrearages must be paid. If you do not wish the magazine continued for another year after your subscription has expired, you should then notify us to discontinue it.

Change of address.—When a change of address is desired both the old and the new address should be given.

New Subscriptions can commence at any time during the year and with any number desired.

Canvassers wanted in every town to solicit subscriptions. Terms sent on application.

Rates to Foreign Countries.

The yearly subscription of the AMERICAN AGRICULTURIST in shillings and pence to subscribers in foreign countries is as follows:

	s.	d.	U.S. cur
Africa except Egypt, Liberia and Congo, Natal and Transvaal	10	3	$2.46
China	11	3	2.76
Madagascar	10	3	2.46
St. Helena	10	3	2.46

Countries in the Universal Postal Union, including Newfoundland, Egypt, Liberia, Congo, Natal, and Transvaal, and all others not mentioned above, 7s. 9d.; United States currency, $1.86.

In clubs of five or more a discount of 50 cents, or two shillings one penny, is allowed on each subscription.

Merchandise.—(Premium articles), except printed matter is unmailable to Foreign Countries.

Books offered by us as premiums in connection with the AMERICAN AGRICULTURIST are mailable to all countries in the Postal Union.

Postage 36 cents. or 1s. 6d., for the AMERICAN AGRICULTURIST for one year must be added to the advertised price of same when taken in combination with a premium book in all Postal Union countries.

Remit by post-office money order, payable to AMERICAN AGRICULTURIST, at New York General Post Office, and inclose the money order with your letter to avoid delay and possible loss. Drafts on New York are acceptable in the absence of any other form of remittance.

Foreign Agencies.

The following Agents are authorized to accept subscriptions and advertising orders:

KEGAN PAUL, TRENCH, TRUBNER & Co., 57 Ludgate Hill, London, England.

JOHN IRELAND, Pietermaritzburg, Natal, South Africa.

JOHN H. EVERY, Dunedin, Otago, New Zealand.

WM. MADDOCK, 381 George street, Sydney, New South Wales, South Australia.

WM. HOPKINS, Rockhampton, Queensland, Australia.

Advertising Rates.

Ordinary Pages, **$1.00** per line (agate), each insertion.
Last Page, and Third Cover Page, **$1.25** per line.
Second Cover Page, **$1.50** per line.
Page next to Reading and Last Cover Page, **$2.00** per line.

Reading notices, set in nonpareil type, to go under the heading "Business Notices," or at the end of a column of reading with "adv." affixed, **$2** per line count.

No advertisement taken for less than **$3.00** each insertion. Fourteen agate lines make one inch.

Discounts.

On ten (10) lines and upwards, 3 months, five per cent.; 6 months, ten per cent.; 9 months, fifteen per cent.; 12 months, one year, twenty per cent.

On forty (40) lines and upwards, 3 months, ten per cent.; 6 months, fifteen per cent.; 9 months, twenty per cent.; 12 months, one year, twenty-five per cent.

Discount on Space Contracts.—100 lines, ten per cent.; 250 lines, fifteen per cent.; 500 lines, twenty-five per cent; 1,000 lines, thirty per cent.

—o—

Direct all Business Communications pertaining to Subscriptions and Advertising to

AMERICAN AGRICULTURIST,

52 and 54 Lafayette Place, New York.